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Address.

SCHOLARSHIP IN MEDICINE.*

BY W. S. THAYER, M.D., BALTIMORE, MD.

WHEN Dr. Lewis asked me to speak to you today, he suggested as a title for my remarks, "Scholarship in Medicine," an alluring and fascinating subject for reflection for one to whom that most blessed privilege is afforded—the opportunity to reflect. From an experience of nearly thirty years, however, I should say with confidence that to none do the gods so consistently deny this privilege as to the physician. Indeed, all the progress of mankind seems to centre in one great conspiracy to search out the secret and silent chambers of the doctor's castle and therein to install a telephone. And the timid doctor has not, as a rule, the courage of one of your eminent instructors who, in the early days, when first this scourge of mankind invaded his laboratory, having endured its incessant tinkle as long as might have been expected of a just and tolerant man, arose with an air of determination and demolished the instrument of Satan.

And so, as I write these words, the hour approaches at which I have promised to speak to you, and the moments for reflection recede slowly and surely.

At a time when honors and awards for excellence in their school work are being given to men who have shown promise, some of them, of becoming what we like to call scholars—at such a time, it is not unfitting to reflect on what we mean by a scholar, and what one means particularly by scholarship in medicine. The word "scholar" is, after all, one not altogether easy of accurate definition, one which has not wholly the same meaning to every man. For instance, the words "scholar" and "student" are essentially different in their significance. The great mechanician, for example, who by his imagination, insight and learning in his special branch, has changed the course of human life, is not necessarily a scholar. He may be an eminent student, but if his attention has been limited to one field, if his all-absorbing work has shut him out—as with such men it so often does—from association with fellow students in other branches of science and art and history and literature—that man is not what one would call a scholar. The words "scholar" and "scholarship" bring to us, I think, the idea of a certain catholicity of knowledge, of a certain breadth of interest and association that the brilliant student whose life is given entirely to a single branch of learning, often fails to attain.

One of the most important attributes of the man that we are fond of calling a scholar, is that active, alert interest in all that surrounds him, which leads him, despite himself, into sympathy and association with men in every sphere of human activity. I remember hearing it said of a certain distinguished diplomatist that he was a dull dinner companion until some word was dropped by a neighbor which told of something that was new to him. In a minute the whole at-

* Address delivered before the students of the Harvard Medical School on the occasion of the award of the John Harvard Scholarships on Feb. 26, 1917.

titude of the man would change; he would become alert, animated, full of suggestive questions, interested in every word that fell from the lips of his companion. The sympathies and interests of such a man soon give him a store of general information, an acquaintance and association with fellow students, a power to drop for a minute the studies to which his special energies may be directed and to follow another lead with real intelligence and profit—an attitude which is indicative of that special mental superiority which we associate with the scholar. Such rare men—for the real scholar is a rare man—are not led from the pursuit of their main object of study by these surrounding interests. Rather does the breadth of their sympathies mature and sharpen their judgment, while the increasing refinement of the man's character, the resources which his associations and learning have brought him, give him a great advantage over his fellows in his relations with the rest of mankind.

The foundation for such scholarship is generally laid in what we have been pleased to call a "liberal education," the common basis for which in this country has been the degree of Bachelor of Arts. The attempt on the part of the university used to be to give the student who attained that degree an elementary education in the classics, history, philosophy, mathematics and later some of the sciences—a basis on which, according to the paths which he might follow in his later life, he might build the necessary superstructure.

A hundred years ago the foundations which led to a degree of bachelor of arts were relatively simple, for our knowledge of the natural sciences was still in its infancy. There was time in the four years' academic course, which was then often finished before the boy was twenty, to give him a sufficient knowledge of the ancient languages, of philosophy and history and mathematics—of the "humanities" as they were called—to make it possible for him in later years to take up the trail and follow in whatever direction it might lead; and at the same time, through his knowledge of Latin, still the universal language of the scholar and the student, to follow the progress of science, of the arts and of literature in foreign lands.

But conditions have changed considerably. Our knowledge of the natural sciences has developed with enormous strides. Latin is no more the exclusive language of the scholar. Thousands of students in special branches of literature and art and science are contributing important researches in their own tongue. To this mass of literature no one language is a key. No man who aims to attain to anything deserving the name of scholarship, indeed, no man who wishes to excel in any one particular branch of science, can safely neglect the study of at least three modern languages—English, French and German.

At the same time, by the individual who wishes properly to fit himself for the study and practice of medicine, more and more time must be given to the fundamental study of the natural sciences, chemistry, physics, and biology in its broadest sense; and the course of studies that he must pursue both before and after his entrance into that which is, strictly speaking, a school of medicine, is ever lengthening.

And thus a very old and frequently recurring suggestion is again being discussed,—the suggestion that the man who intends to prepare himself for the study of medicine should devote himself almost purely to the study of the natural sciences, and should save the time which is believed by some to be wasted in the study, in particular, of the ancient languages. Again, various plans have been adopted in this and in other universities which tend to shorten the course of studies which lead to the degree of bachelor of arts, and to include in the work which is counted upon as leading to this degree, some of the studies pursued in the school of medicine. Much has been written of the wasted years of college life, and much has been said of the time which is lost in the preparation of a student for practice.

It is, I think, certainly true that there are some very paradoxical conditions associated with our college education. There is no reason why it should not be possible for an intelligent student, with a proper preliminary education, to accomplish the studies which bring to him the degree of bachelor of arts by the time he is nineteen or twenty years of age. Most boys if sent to good English, French or German preliminary schools could do this easily and without the least drain on their physical condition. There are serious defects in the management especially of our secondary schools.

If the day ever arrives when the teaching in our secondary schools is conducted by men who are, for a considerable part, scholars, as is the case in the better European schools, this truth will, I think, become clearly evident. A large part of this instruction up to the present day, has been given by young men teaching up to the limits of their knowledge, in the hope of attaining a competence sufficient to allow them to abandon the field of pedagogy for something that to them is more profitable. Such men teach the classics as if they were dead languages. Indeed to them Latin and Greek are dead languages. It is useless to try to teach a dead language. Such men are not likely to inspire the youth with a great love of knowledge. One trouble with our secondary education is that the opportunities in our country are still so great that the career of a teacher, with its small salary and its restricted opportunities, does not appeal to the ablest men. Our boys are not so well taught as are English and French boys, and they waste several useful years in the secondary schools.

Another rather unfortunate condition exists

in many of our universities. The old four years' academic course, leading to a degree of bachelor of arts, has become one of the dearest of American traditions. The traditions that are associated with this course were founded upon conditions existing over a hundred years ago, at a time when the students were on an average, several years younger than they are today, and when the general supervision of the college was much more strict and much more that of our larger secondary schools. But the conditions of life in the academic department of the university have changed greatly. With the development of the elective system, the students were thrown much more on their own responsibility with regard to their studies, while gradually the freedom of life has approached almost that of the European university, so much so that parents dread to send their sons practically out into the world at the age at which they might perfectly well be fitted to enter college. Most boys, if they had proper educational advantages, could finish a half of what they now do in college before the time when, in the natural course of events, they enter today; and so, in many instances, now, they are held back. With the happy arrangements that have been introduced at Harvard in connection with the work of the freshman year, it should become possible to send a boy to the academic department considerably earlier than one might otherwise have felt it prudent.

But still there remains the grave question as to how to bring it about that the boy with whom time seriously counts, may attain the academic degree to which his work entitles him, at the age at which he might perfectly well accomplish it, without sending him to college at fifteen or sixteen. It is a serious question, but one which we cannot discuss further at this time.

How do these conditions affect the man who seeks to be a scholarly physician? The attributes which we recognize as those of the scholar are the same whatever be the main interests of their possessor, whether he be lawyer or physician or historian or philologist. It must, of course, be acknowledged that the seeds of scholarship lie mainly, not in what a man is taught, but in what a man is. I think of one physician who may rightly be called a scholar, whose early education in the classics, for instance, was limited. His sympathies, however, have led him into such constant communion with the great minds of the past that to read his words one would hardly fancy that he had not conversed with the old masters in their own tongue. But such men are unusual, and I feel very earnestly that the surest basis for true scholarship lies in a good elementary education,— an education which demands a study of the classics and of mathematics at least as extensive as that which used to be required in most of our universities fifty years ago. A large part of this, as I have said before, could be acquired perfectly well before the boy enters the college proper; and under the conditions which exist today this should be made possible.

I know that there are many who disagree with me, but I have been greatly interested as the years have gone by, to see how strongly some of my colleagues, who have devoted themselves to the natural sciences, have come to realize the importance of an old-fashioned basis in the humanities for the man who wishes to take a really scholarly view of his subject. As I said a moment ago, I cannot imagine a man expecting to attain eminence, certainly not scholarly eminence in medicine, without an easy reading knowledge of French and German. He ought to have more; he ought to have a speaking knowledge. There is nothing that will make the acquisition of such knowledge easier than a fundamental basis of Greek and Latin. To him who has been well trained in Latin and French, a reading knowledge of the other Latin languages —Italian, Spanish, Portuguese and Roumanian —comes of itself, if the need be.

A good fundamental training in mathematics is absolutely necessary to him who must be familiar with modern physical and chemical methods. So far as the question of time alone is concerned, there is no reason why a student who leaves the academic department of a university at the age of twenty-one should not have, besides a sufficient biological, chemical and physical training, a good basis in the humanities.

"But still," some will say, "although the study of Latin may be of advantage in acquiring French or Italian, those languages can perfectly well be learned without it. Is the study of Latin and Greek not waste of time for a boy who might, by giving them up, save two years of his life?" It all depends on what one calls a waste of time. One might, perhaps, call it a waste of time if his chauffeur should seek to study Greek and Latin as a preparation for his career. A chauffeur may acquire considerable mechanical skill in a very short period of time by the study of machinery and by working his engines. If he be a clever fellow, he may go further. But if his aim be to become a chauffeur, and if he must make his living as soon as possible, he cannot afford the time for much schooling. Yes, if one aims to be a chauffeur alone that argument is, I think, good. If the individual who starts to study medicine, aims simply and solely to attain proficiency in one particular branch of the art of medicine, it may certainly be possible for him to do good work without the knowledge of Latin and Greek. But I do feel very strongly that the man who, from the beginning, seeks to follow only those paths which may lead most quickly to the practice of the branch which he has selected, or which he fancies he is going to follow, is deliberately building about himself a wall which may well hem him into a narrow path for life, and

shut out from him opportunities for which in after years he may long.

There are relatively few students who, in the medical school, are able to tell just what their future career is to be. How many men who are convinced that their future lies in surgery, find themselves, ten years later, in an entirely different branch of work? I fancied that my career was to be that of a surgeon. For nearly three years I never once doubted it; and then events happened which entirely changed my course. If I had devoted myself purely and simply to a preparation for the life of a surgeon, those opportunities would not have come to me. How much less common is it for the student who enters the academic course, to know with certainty the path which he is to follow; and when it is a matter of a boy of thirteen or fourteen in a secondary school it would be a rash father, it seems to me, who would deliberately plan to limit the boy's training to one special course of work.

The man who has to cover so much ground as he who desires to pursue the study of medicine from the point of view of a scholar can hardly expect to find himself prepared to enter a school of medicine, as they are now constituted, before his twenty-first year. By this time, with proper schooling, he ought to be able to cover the necessary ground in ancient and modern languages, mathematics and natural sciences. But he cannot do it if he prepare in the ordinary secondary school along with the other boys of his age. That is the grave difficulty. We should have secondary schools in which boys who have passed their college examinations at 15 and 16, may still pursue a year or two of work in the humanities or natural sciences—work which will all be valuable to them in their after-career. The difficulty for the boy who is to study medicine lies in his pre-academic years—in the years of his secondary schooling, years in which he is too often held back.

I am, then, one of those who believe earnestly that a broad, general training, not only in the natural sciences, but in ancient, as well as in modern languages, and in mathematics, is important for him who is to study medicine if he desire to be a broad-minded and scholarly man.

And now a word or two as to the course of the student in the school of medicine. In a letter written to me à propos of this very talk, the writer referred to the discouragement felt by some students owing to the extremely crowded and dull character of the curriculum. I think I understand that to which he referred, although I cannot understand how anybody could refer to a medical curriculum as dull. When I was a student, although I was discouraged enough, heaven knows, time and again, there were few dull moments in the course.

But, it may well be asked, how can a man with scholarly tastes be happy in a course so crowded as is our four years' curriculum, and what can one do to make life more endurable for him? It is undoubtedly true that our American medical course is extremely crowded. The main reason for this is our graded class system, which has always seemed to me fundamentally and radically wrong. As I have said elsewhere, I feel very strongly that by the time a man is ready to enter a school of medicine he should be of an age and a degree of development at which it should be possible for him to select and follow his courses as he will, and to present himself on his record for examination and for acceptance for his degree when he is ready, and not before. A graded class system is a makeshift rendered necessary in schools because of the number of the students and the variation in their habits and natural abilities. With children a class system is necessary unless the individual is led by a private tutor. In our academic departments the class system also still remains and is probably desirable. But when a man enters a school of medicine he should be as free as he is in a European university, under certain general guidance and limits, to pursue his studies as deliberately and thoroughly as he may choose. I feel strongly that while a limit should be set as to the rapidity with which a student should go through his course in medicine, we ought not to apply methods designed for school boys to serious-minded men. There are many men in a school of medicine who, by spending one or two years more at their work than do their fellows, may emerge far maturer and better physicians than their more brilliant colleagues who go through our present course as easily and without effort or strain. I hope I may live to see the day when American universities may not only afford such opportunities to students of medicine, but may also encourage their migration from one institution to another; when it may be possible for the keen and discriminating man to accomplish his studies in those laboratories and clinics which most appeal to him, no matter if his course lead him from Boston to San Francisco and back again. It is well to remember that in America we are trying to make a class do together in a given period of time, work which, in other countries, many of the best students accomplish more deliberately, according to their own abilities.

But at the present moment we have, unfortunately, I think, a graded class system, and each man has to follow it alongside of his fellows; and, furthermore, the work that this entails takes almost all of his time. No one can go through this or any other good American school in four years and do all his work as he would like to do it. Under these conditions it is, I think, important that the student do not attempt to specialize too early. You need most of what you are obliged to pass through in the high school system that is now ours, and as I said a moment ago, you cannot tell, no matter how sure you may feel today, where you are going to bring up.

And then, another bit of advice which may seem rather paradoxical.

I am never tired of emphasizing the difference between the modern and the older methods of instruction in medicine. In the older days much of that which we were taught was a matter of authority. Propositions that we were assured were truths were fed to us. Today our effort is more to teach you methods by which you may control and prove the assertions which are made by others. Our desire is rather to make you doubt the propounded statement unless a satisfactory proof is advanced, or unless you can confirm it by your own methods of control. And this should stimulate a love for inquiry and investigation which should tend to make of you the student that the true physician must remain throughout his life. If you are the right sort of a man, you are going to find yourself during the course of your studies, interested in many questions which may lead you into independent investigation. But how hard it is to find the time for such work in the midst of a prescribed four years' course! And when I say that one of the most valuable forms of training for the student of medicine is a certain amount of original work done under proper direction during his course, you may find the advice in direct contradiction to what I have said before. One of the discouragements that you will meet, it is true, is that you will have so little time for such work. But some investigation tucked in during the year or during the summer vacation can only do you good. There are occasions when the student who can afford it, pursuing his medical studies under the system which I hope will be ours some day, might well interrupt his work for six months or a year, or even more, to pursue some specially promising research. I can easily fancy that by the advice of an instructor, some students might wisely do this under our present system. This much I would say: do not let anyone discourage you from the desire to investigate; grasp every opportunity for research, though they may be few, during your school course. Do not, however, fancy that because you are interested in some promising field of investigation you can properly neglect your other work, and expect to receive due credit for it. I have had some amusing experiences of this sort in which brilliant men, who might well and profitably have given up a year of their medical course to a problem of research, have felt injured because the faculty would not grant them credit for routine work which they had entirely neglected.

I have referred several times to the necessity of a knowledge of modern languages. If you have not now an easy reading knowledge of French and German, acquire it. You will need it every day of your life, and you will never regret its acquisition. Go to a Berlin school; learn to talk and not simply to read the language. Buy books on the technical subjects in which you are interested and read them. If you are not able to go to foreign countries, seek opportunities to hear plays in foreign languages or go to churches where you can hear sermons preached in a different tongue. A little sustained effort will give you a reading knowledge before very long, and that is really most necessary.

And then when you have finished the course in the medical school seek, so far as you can, to make the acquaintance of men and methods in other parts of your own country and in other countries. It is as profitable for a man to "go to Europe" today as it used to be fifty years ago. A period of time spent in a foreign city, sufficient to give one an insight into the language and habits and ways of the people, and especially to give one an acquaintance and association with one's colleagues in a foreign country, is of great value.

Go to large medical meetings in this or in other countries whenever you have the opportunity. Men will often speak to you slightingly of the value of such gatherings. They will tell you that nothing important is done there, that the social functions quite overwhelm any serious work, that they are a pure waste of time. Do not believe them. There is no more valuable experience than that of making the acquaintance of the student whose communications you may have to read. Such experiences often modify greatly our estimate of the importance and worth of the man and his publications.

It is always interesting and surprising to the good student to find in his own country, first, how much there is that he can learn from the methods and practice of colleagues who live but a few hundred miles away, and secondly, how much he himself can bring to them. Osler's advice to all his students used to be to become peripatetic doctors, and it is not bad advice.

Every student who can—after he has finished the year's service in a hospital, which all ought to seek—should endeavor to spend a year of study at some school other than that with which he has been familiar as a student or house physician. He should seek an opportunity, either in Europe or in this country, to put himself under the direction of some good man associated with active university work or with an institute for medical research, and if possible undertake a piece of original work. Such a year cannot fail to be of great value to him. It may lead him directly into the special branch of study to which in after life he is to give his main attention. It will certainly expand his horizon considerably. And what is sometimes hard for the modest student to realize—if he has done good work in the school, in a hospital and then in a new clinic or laboratory, his name and his attainments will soon become reasonably well known in American medical circles. Someone said several years ago,—I think it was one of your own

professors—: "How surprised the students would be if they realized how important a part they occupy in the conversation of their teachers!"

It is a trite observation, that it is well for the professional man to cultivate outside recreative interests. Such interests come naturally to one with a scholarly mind. It may be the love of music or literature or art that leads the student of medicine into side paths of study or rest or dreams. I know a professor in a large university who, in his summer vacation some years ago, uninstructed and unadvised, took up the brush, and today is painting landscapes of real beauty and merit; this man has found not only a recreation but an occupation which, throughout his life, will push backward the limits of age. It may be the collection of monuments of antiquity, of old books or letters, than which nothing is more fascinating. Many of us have a deeply implanted love for that which is old. Indeed, he who can pick up an old book or enter an old house or listen to the music of an old opera without seeing charming visions with his mind's eye, is deeply to be pitied. Who can litsen to an opera of the Second Empire, let us say, without seeing the crowded galleries, the dresses and figures and faces of those days, the flowers in the hair, the waxed moustache, the crinolines, the brilliant uniforms, the twinkling lights on the boulevards without? Who can turn the leaves of his incunabula without dreaming of the old eyes that have gazed on these pages, of the old fingers that have turned them and inscribed their fading annotations on the margins? Who can read the old letters without fancying himself in the midst of the quaint or stirring scenes evoked by the yellow lines; and in free hours, when the mind and body demand rest and relaxation, what can take us farther away from care and anxiety than dreams such as these?

A distinguished German professor, in the period of his sanity, has advised that every scientific man might do well at the height of his career to change his calling and enter upon new paths of activity,—a radical suggestion and one possible only to the scholar of catholic interests. But there are events in the lives of many men which make such a change necessary, and he who, in the days of activity and success, has cultivated broad outside interests as a recreation, may find in these very interests in the hour of illness or misfortune or necessity, the means of his re-creation.

With these few thoughts which have come to my mind between telephonic tinklings, I must close, for as one of the wisest of Boston doctors* has said, "It is a Trespass on the *Rules of Prudence* never to know *when to have done.* Wherefore, *I have done!*"

* Rev. Cotton Mather: Directions for a Candidate of the Ministry, etc., 12°, Boston, 1726.

Original Articles.

RENAL STONE.*

BY GEORGE GILBERT SMITH, M.D., BOSTON.

[From the Genito-Urinary Department of the Massachusetts General Hospital.]

RENAL stone is a subject upon which much has been written, particularly from the clinical and operative points of view. There still seem to be gaps in our knowledge of the natural history of calculus formation; of the best way to treat certain types of stone-ridden kidneys, and of methods, operative and dietary, looking to the prevention of recurrent stone. Upon these aspects of the question I feel sure the last word has not been said. This paper is an endeavor to present some of the less thoroughly understood phases of renal stone.

The formation of renal stone is an interesting problem. Many writers hold that a nucleus of organic material, such as bacteria, desquamated cells or pus, is necessary to start the process of precipitation. Others believe that crystals deposited from a supersaturated urine become bound together by colloid material, which may be albumin or may be the colloid coloring matter of the urine. (W. G. Smith,[1]) Cabot and Crabtree's statistics[2] show that in 12 cases of nephrectomy for stone, calculus formed in the remaining kidney but once, whereas in 66 cases in which the stone was removed by pyelotomy or nephrotomy, there were recurrences in the operative kidney in 32. This fact, they consider, suggests that "there is some condition in the kidney itself which influences the formation of stone and which does not exist to the same extent in the opposite kidney." Undoubtedly this is true, as a kidney traumatized by calculus and by the operation for removal thereof provides pockets in which urine is retained and contains organic nuclei all ready for the deposition of salts, *provided the urine contains those salts in an easily precipitable state.*

Admitting that a diseased kidney invites stone formation, I would nevertheless draw a different conclusion from Cabot and Crabtree's figures. The fact that stone recurs in 1 of 12 nephrectomized patients, and occurs in only 1 of 100,000 ordinary people, points to a factor in stone formation which affects both kidneys.

The number of cases of bilateral stone in a series looked up by me, 5 out of 34, is strongly suggestive of a condition common to both kidneys as the underlying cause of calculus formation.

Shattuck (quoted by H. G. Wells[3]), from a study of uric acid stones, found that organic nuclei were extremely rare; that the center almost always consisted of a primary crystalline deposit. Henry (quoted by Kahn[4]) found that 158 of 187 calculi had uric acid nuclei; Utz-

* Read at the Surgical Fortnightly Society, Dec. 12, 1916.

mann (also quoted by Kahn[4]) found that in 545 stones, 80.9% had uric acid nuclei; 5.6% had nuclei of calcium oxalate. It is stated by W. G. Smith[1] that crystals of uric acid formed in the urine (in the presence of colloid pigment) differ from those formed artificially.

Whether crystals alone may be the nucleus, or whether they require a colloid to bind them together, is not of practical importance. Colloids sufficient for this purpose occur in normal urine (coloring matter). It is an established fact that stone will form in a kidney which shows no sign of past or present infection. If organic matter is needed, it can be obtained in the absence of inflammatory processes. Such processes, however, in conjunction with a urine favorable to the formation of calculi, render more likely the recurrence of stone (cf. Cabot and Crabtree.)

This phase of the subject should not be passed without mention of the theory that an important factor in the formation of stone is retention of urine within the kidney pelvis. Fowler[5] of Denver ascribes the formation of stone to stasis of the urinary stream within the pelvis, and says that in every case he examined, some obstruction could be demonstrated by pyelography. As a remedy he proposed the suspension of the kidney in a position parallel with the 12th rib, thus aiding renal drainage by gravity. There is not time to take up the arguments against this theory; unquestionably if stasis exists, it does assist in calculus formation. The formation of stone in kidneys which are not poorly drained, and particularly in both kidneys of the same individual, is frequent enough to upset the claim that renal retention is a necessary factor in calculus formation. The fact that Fowler's suggestions have not been adopted by genito-urinary surgeons is significant of their value.

Evidence cited above seems to show the frequency of uric acid as a nucleus. Beyond that point the part played by this substance is very small. Uric acid, either as such or as the urate of calcium, is rarely the chief constituent of renal stone (Kahn[4]). In a series of 34 analyses or renal and ureteral stones made by Denis, in the chemical laboratory at the Massachusetts General Hospital, only one stone was composed chiefly of urates. MacKarell, Moore and Thomas (quoted by W. G. Smith[1]) found that of 24 stones, only 2 were pure urates. In the majority of stones examined by them, uric acid was present and formed from 2 to 10% of each stone.

If stones be classified according to their chief constituent, the oxalate stones are the most frequent (Wells). In our series of 34, 16 were composed chiefly of this substance. Oxalic acid in the urine is derived to a certain extent from food ingested. It is found in particularly large amounts in such foods as rhubarb, spinach, strawberries, figs, tomatoes, plums (Schildecker[6]).

Calcium oxalate, the form in which oxalic acid occurs in the urine, is kept in solution best in acid urine, although it may be precipitated in urine of any reaction. It is the least soluble (Smith, W. G.) of the salts which commonly form stone.

Although the belief is held by some that oxalate calculi can be distinguished by their gross appearance, this is not so. The presence of blood pigments may disguise the true color of any stone, and the determination of its composition must be left to the chemist.

The substance next in frequency as the chief constituent of stone is phosphate, combined with calcium, magnesium or ammonium. Calcium phosphate is the most usual salt, but frequently it is mixed with the others. Typical phosphate stones are yellowish-white, soft, friable, and grow rapidly. As will be shown later, the large majority of recurrent stones are formed of this substance. It is important to consider the elimination of phosphates, in order to determine methods of decreasing their percentage in the urine.

Phosphoric acid, from which the phosphates are formed, is derived chiefly from foods, and to a much slighter degree from the metabolism of nucleo-proteins. In the organism, it is neither oxidized nor reduced (Smith) but plays a most important part in preserving the blood reaction. The factors concerned in maintaining this equilibrium are carbonic acid, bicarbonate of soda, monosodium-phosphate and di-sodium-phosphate. To quote Forbes and Keith[7], "The processes concerned may be represented by the two equations:

$$M_2HPO_4 + HA \leftrightarrows MA + MH_2PO_4$$
$$MHCO_3 + HA \leftrightarrows MA + H_2CO_3$$

M stands for any basic radical; A for any acid radical.

The indications are that in the fluids of the body the carbonic acid is present as carbonic acid (H_2CO_3) or sodium bicarbonate ($NaHCO_3$), and all of the phosphoric acid as monosodium phosphate (acid sodium phosphate) or di-sodium-phosphate. Now, mixtures of these compounds in solution possess greater power than any other known salts for balancing each other, and any acid or base that may be added, so that the solution always remains neutral." (page 178.)

The sodium which in the blood is combined with the phosphates is to some extent replaced in the kidneys by calcium or magnesium or ammonium, and is thereby spared from excretion, and is returned to the blood to offset the constant tendency of the body fluids to become acid through the formation of acids by metabolism. The calcium, magnesium and ammonium phosphates which are excreted in the urine are the salts from which phosphatic stones are made; in insolubility, calcium phosphate (the commonest salt) stands next to calcium oxalate. The phosphates of the alkali metals (sodium, potassium, etc.) are soluble, hence do not appear in

stones. A high degree of acidity of the urine tends to hold calcium phosphate in solution, but on the other hand, as acidity is obtained chiefly through the medium of acid phosphate, the greater solubility of the phosphates is offset by their increased concentration. Phosphoric acid in food is absorbed chiefly in the upper intestine.

Uric acid occurs in the urine as the acid itself, or as one of its salts, i. e., calcium urate, sodium urate, ammonium urate. Although it occurs to a slight degree in nearly all stones, it is rarely the chief constituent (Kahn). In our series of 34, it was the chief constituent once, and was present in traces three times. There seems considerable evidence pointing to the importance of uric acid as the nucleus of renal stones (see above). Wells makes the statement that uric acid probably furnishes the nucleus for most stones, and is thrown down in highly acid urines.

Uric acid is derived partly from endogenous sources—metabolism of nucleins—which cannot be greatly influenced. (Schildecker). The exogenous sources, however, can be diminished by the omission of certain foods from the diet. These will be discussed later.

Calculi of calcium carbonate are supposedly rather unusual in man, although common in herbivorous animals. In our series of 34 cases, in two calcium carbonate was the chief constituent, combined once with a trace of phosphate, once with a trace of oxalate. These stones are more soluble than calcium phosphates, less soluble than calcium urate. They form only in alkaline urine.

The more unusual stones are composed of cystin, xanthin and very rarely of albuminous bodies (Miyauchi[8]).

Kretschmer[9] found 107 cases of cystin stones reported since the discovery of cystinuria by Wollaston in 1810. He added two cases of his own (both vesical). Apparently cystinuria is due to faulty metabolism of albuminous products, and is caused by a hereditary condition of the liver.

In summarizing the chemistry of renal stone, it appears that the great majority form upon nuclei of uric acid; that other salts are then deposited, most frequently calcium oxalate, next frequently, the phosphates. Unusual stones are pure urate, calcium carbonate, cystin and xanthin.

Occurrence: Apparently renal stone occurs about equally in men and women (Cabot and Crabtree). The most frequent time of stone formation is between the ages of 15 and 35 (ditto.)

The occurrence of stone among people of certain districts has long been noted. Thus in England stone occurs in certain Eastern counties as frequently as 1—63,000, whereas in Northwestern counties the incidence is 1—210,000. (Smith.[1]) Such a marked difference as this would seem to be due to a difference either in diet or in water ingested. The inorganic matter found in water consists chiefly of calcium carbonate, calcium sulphate and calcium chloride (Harrington, page 330). None of these is a frequent important constituent of renal stone, and the only possible connection between the ingestion of "hard" water and the formation of stone would be through the larger amount of calcium taken into the system.

Pathology: The effect of stone upon the kidney in which it lies depends largely upon mechanical relations. A stone which is of the proper shape or size to obstruct the outflow of urine will cause damage through hydronephrosis, which quickly becomes pyonephrosis. The other method of producing damage is through infection and ulceration. In such cases we do not know whether the infection antedated the stone, and perhaps was a factor in its beginning, or whether it fastened upon the kidney as a result of trauma caused by the calculus. It is certainly true that the majority of renal stones are accompanied by infection at the time of their discovery. Aseptic stone, however, does occur not infrequently.

The amount of damage to the kidney by calculus depends upon (1) obstruction; (2) infection. If due to the former, there is no hope of recovery of function, unless the obstruction is acute and of only a few days' duration. If due to infection, the removal of the stone and drainage of the kidney may in a measure restore the functional ability of the organ.

The position of the stone in the kidney is highly important. If in the pelvis, the entire kidney will be affected equally; if in a calyx, that cavity is likely to be dilated and the parenchyma surrounding it thinned, at times so much so that only the kidney capsule bounds the pocket of stones. The remainder of the kidney in such cases is usually unaffected.

The amount of damage which actually occurs is suggested by figures from the paper by Cabot and Crabtree on Recurrence of Renal Stone. Of 66 cases of renal stone, nephrectomy had been done in 12. From the number of cases of nephrotomy or pyelotomy in which recurrence took place, it is possible that nephrectomy should have been done in more.

The symptoms of renal stone vary as greatly as the pathology, and in fact are dependent thereon. Pain is of two types: (1) the dull lumbar ache caused by stretching of the renal capsule from urinary retention in the kidney or from the swelling or inflammation; (2) the sharp, colicky pain, usually accompanied by nausea, which is radiated along the ureter to the bladder, and even into the scrotum or labia. The latter is due to unusual activity of the smooth muscle of the pelvis and ureter, aroused by its effort to dislodge a stone (Squier[10]), and is analogous to the "cramp" caused by violent intestinal peristalsis. In obscure cases, fist per-

cussion in the costovertebral angle is of value in eliciting pain. In a not inconsiderable proportion of cases, however, pain is entirely absent. Two cases come to my mind.

A young man in excellent health had been turned down by an insurance company because of albumin and a small amount of pus in his urine. He had never had a pain referable to the genito-urinary tract. X-ray showed a calculus the size of a marble in his left kidney. At operation, a very sharp stone was removed from an upper calyx.

A woman of 32 came to the genito-urinary clinic because of persistent hematuria, duration three weeks. She had not had a pain or ache of any kind. X-ray showed in the right kidney region a large branching calculus, the outline of which so closely resembled that of an injected pelvis that I thought the plates must have been mixed. Operation showed a kidney almost completely destroyed, apparently by a very chronic obstruction to the outflow of the urine. There was no infection whatever.

In the majority of cases of renal stone, pain of one type or the other is or has been present. Morris (quoted by Keyes, Diseases of Genito-Urinary Organs, 1911, p. 417) in 103 cases, found pain present in 71 cases (69%).

The occurrence of pain referred to the healthy side—the so-called "reno-renal reflex"—is doubted by Keyes. Cases have been reported by as good observers as Krotoszyner[11] and Fowler[12]. At any rate, the pain of renal stone is, as Cabot says, "a highly misleading symptom." Nor can the urinary findings be entirely relied upon. In 150 cases of renal and ureteral stone, Cabot[13] found the urine negative at more than one examination in 6 cases of renal stone, and 15 of ureteral stone. Morris (see above) found pyuria in only 48% of his 103 cases of renal stone. Blood, although frequently present, is absent in a number of cases (Keyes) and is present in so many other renal conditions that it is not of great value. A positive x-ray is, of course, the best proof of renal stone. Even that is far from infallible. Considering both renal and ureteral stone, Cabot found the x-ray at fault in 6%, and believes that 15% of errors would be nearer the truth. The belief that pure uric acid stones do not show is substantiated by Newman[14], but these stones are very rare and even a small amount of earthy salts such as calcium phosphate makes them visible. Geraghty and Hinman[15] found that in a series of 67 ureteral stones, 22.4% were missed by the x-ray. Those missed were calcium phosphate and carbonate and not uric acid.

Even a so-called positive x-ray may be at fault. Krotoszyner[11] reports a case which showed a shadow in the region of the kidney accompanied by renal colic. At operation, a calcified tuberculous lymph gland was found, and no stone in the kidney.

We find, therefore, that in the diagnosis of renal stone it is unwise to depend upon any one bit of evidence, unless that evidence is supported by other positive findings. The situation is well summarized by Cabot[13] as follows:

1. In all cases of abdominal pain of chronic or recurring type, in cases of backache, lumbar or sacro-iliac joint strain and lumbago, careful repeated urinary examinations, including sediment, even if albumin is absent, and catheter specimen from female, are essential before diagnosis is made.
2. X-ray alone is insufficient evidence of renal stone.
3. In cases suggesting renal stone with negative urine, negative x-ray and free ureter, a wax tip catheter will usually give the diagnosis unless the stone lies in a dilated calyx.

Prognosis: Without operation renal stone will surely destroy the kidney in which it lies. This process may be so slow that it will in no way prevent the individual from reaching the three score years and ten of Biblical fame, or it may bring about, through an accident of obstruction or infection, one of the acute crises of surgery.

Even if the stone is removed by operation, recurrence is likely to take place. Cabot and Crabtree found that of 63 cases of nephrotomy or pyelotomy, stone recurred in 34, and of 21 cases of ureterolithotomy, in 6.

The tendency to recurrence seems to me to be the chief problem in the surgery of renal calculus; measures to prevent this most disheartening occurrence must be both *operative* and *post-operative.*

Treatment of Renal Stone: In mapping out the treatment of renal stone, the surgeon should have as a foundation for his decision certain data in regard to the patient. The age and general physical condition must first be considered; in relation to these, the influence of the kidney condition upon the patient. The absorption of toxins from an infected kidney may render necessary an operation which in other respects would be inadvisable. The signs of renal insufficiency, particularly those pertaining to the gastro-intestinal tract, must be borne in mind. Anorexia, flatulence, nausea and vomiting may be indications either of reflex nervous disturbance or of uremia. The total renal function, best estimated by the phenolsulphonephthalein test, should be determined, as well as the specific gravity, the albumin and the sugar content of the urine. The function of the separate kidneys should be known.

Good x-rays of the entire urinary tract are essential. In most instances it is hardly necessary to determine the exact position of the stone in the kidney. This may be done by x-ray with a visible catheter in the ureter, or by pyelography, but my feeling is that in the majority of cases, the additional knowledge gained is not worth the discomfort and expense to the patient. Whether the stone can be removed by pyelotomy, or whether nephrotomy will be nec-

essary, can be determined after the delivery of the kidney.

The question of the advisability of nephrectomy, on the other hand, had better be settled, at least tentatively, before operation. If the other kidney is normal, as evidenced by a negative urine, negative x-ray, and a good function, a markedly decreased function upon the stone side should always suggest nephrectomy. This may sound radical, but I believe that it is much better, particularly among working people, to remove a seriously damaged kidney at the first operation, than to leave an infected organ which, in at least 50% of the cases, is sure to form stones, and which has at best only slight value as an excretory organ. The question is a delicate one, to be decided by each operator when the kidney is in his hand. But in order to decide wisely, he must know those facts to which reference has been made.

If he decides against nephrectomy, pyelotomy is the best route for removal of the stone. If the stone is partly in the pelvis and partly in a calyx, and so fixed that it cannot be delivered by pyelotomy, the renal tissue overlying it may be incised by a lateral incision, extending upwards from the pelvic border. If the stone is in a dilated calyx whose wall is much thinned, the incision may be made through the thinned out cortex. In such cases I have tried to obliterate the cavity by infolding the wall, but I have no evidence as to the success or failure of this manoeuvre. If the stone is so large that it can be removed only by splitting the kidney from end to end, nephrectomy will probably be better than nephrotomy. If the kidney tissue is relatively thick, the chances of post-operative hemorrhage will be about 1 in 2; if it is much thinned, the organ is useless.

For incising the renal parenchyma, a liver needle and silver wire have proved very satisfactory.

A few stone kidneys should be drained after removal of the stone. If a considerable hemorrhage seems likely, it is well to provide a vent for the blood instead of sewing up all avenues of escape except the ureter. If there is much sepsis, drainage will relieve this more rapidly than no drainage. Folded rubber tissue passed through a small hole in the cortex into the pelvis, or directly into the pelvis, does not leave a sinus lined by necrotic tissue as does a rubber tube.

With a view to the prevention of recurrence, the following points in operative technic should be observed: (1) A pyonephrotic kidney with insufficient ureteral drainage should be removed.

(2) Poorly drained pockets in kidneys should be obliterated, resected or provided with drainage. Encrusted or septic kidneys should be drained.

If the disease is bilateral, it may well be that operation is contraindicated. I have seen several individuals with large bilateral calculi which gave very few symptoms, but which had reduced the renal function to so great an extent that operation seemed a risky procedure, which, even if successful, would not materially lengthen life. In less advanced cases, operation is certainly indicated. Authorities agree that the better kidney should be operated first. In deciding which side should be attacked first, the surgeon must consider the separate function, must decide in which kidney the stone will do more injury, and determine, if possible, in which kidney pyelotomy will suffice, and in which nephrotomy will be necessary. (Zondek[16].)

In certain individuals, especially those with bilateral stone, the likelihood of recurrence makes the prognosis very poor. One cannot have his kidney opened every year or two, and yet if rapidly growing stones are left alone, the kidney will be destroyed. Such a case was George A., an otherwise healthy young Albanian. In June, 1914, I removed a stone from the lower end of his right ureter. At that time x-ray showed a faint shadow in the course of the left ureter, but a catheter had passed freely to renal pelvis. He developed a stricture of the right ureter just above the bladder, and in December, 1914, I transplanted the right ureter into the bladder. At that time x-rays of the urinary tract were negative save for a faint shadow below left ischium, thought to be a phlebolith. October, 1916, he became very ill, with high fever and great tenderness in the left flank. X-ray showed a small stone in lower calyx of the left kidney, a larger stone impacted in upper third of left ureter, and three small stones in lower end of left ureter.

I operated upon him again, delivering a large, swollen kidney, from which I removed a small stone. The stone in the upper ureter was removed and the kidney drained by a tube through the cortex. Three weeks later his fistula had closed, and he again ran a temperature. I removed the three stones from the lower ureter. Since then, he has been very well. The stones were calcium, magnesium and ammonium phosphate.

A case such as this—we have had several at the Massachusetts General Hospital—offers little encouragement unless something can be done to prevent the recurrence of the calculi.

Too often the patient is dismissed with the admonition to drink "plenty of water" and is not seen again until another stone has formed. After operation, the condition of the urinary tract should be carefully studied. If the urine contains pus or bacteria, their source should be determined, and vigorous measures should be instituted to the end that the condition causing them may be cleaned up. This will usually be found to be a pyelitis, and must be treated first by the administration of hexamethylenamin in large doses—40 to 80 grains a day—accompanied by sodium acid phosphate unless the

urine is strongly acid. If this does not suffice, the pelvis of the kidney should be washed with silver nitrate, one per cent.

I have now under observation a case of post-operative pyelitis in whom one pelvic lavage was followed by most marked improvement in the urine.

In looking up the records of the 34 cases in which analyses of the stones were recorded, it appeared that 5 out of the 34 were bilateral. In 3 of these 5, the disease was recurrent as well. There were no recurrent unilateral stones. In 3 of the five cases, the stones were practically pure phosphate stones. In the other two, the stones were composed fairly equally of phosphates and oxalates. Of 16 cases with calcium oxalate stones, none was recurrent. It would seem, therefore, that the phosphatic stones are the ones to be dreaded, and that if dietetic measures will be of any help, they should be tried.

It goes without saying that the urine should be kept very dilute by the ingestion of much water. In addition to this, the ingestion and absorption of phosphates must be diminished. If the intake of calcium is also diminished, phosphates will be excreted as salts of sodium and potassium, which are soluble.

Lehmann and Strauss (Forbes and Keith[7]) found that the ingestion of the alkaline earth carbonates, such as chalk, increases the percentage of phosphates excreted through the intestine. With this Zuelzer agrees, and Von Noorden and Dapper have adopted the method. Herxheimer found that calcium carbonate baked in bread to constitute 5% of same, caused marked decrease of output of phosphates in the urine.

To prevent the recurrence of phosphatic stone, therefore, one should drink freely of water, take a teaspoonful of calcium carbonate with or after meals, and avoid eggs, milk and fish, and fruits.

If the stones are oxalate, Schildecker[6] advises keeping the urine highly acid. Carbohydrates, which by their fermentation increase the formation and absorption of oxalic acid, should be eaten sparingly. Avoid foods of high oxalic acid content, such as rhubarb, spinach, strawberries, figs, potatoes, tomatoes, and plums.

To prevent uric acid deposition, avoid highly acid urine. Eat chiefly of vegetables, fats and carbohydrates. Eat a low proteid diet of purin free nature. Avoid asparagus, liver, sweetbread, kidneys, meat extracts, and malt liquors, claret etc.

Cystinuria: Klemperer and Jacobi (Schildecker) cleaned up a case by giving sodium bicarbonate 0.6 gr. per day.

In the case of mixed stones, in which the phosphates play a part, dietary treatment should be directed towards a diminution of phosphates in the urine. Our experience seems to point with a good deal of certainty to the phosphates as the cause of recurrent stone.

As evidence of the practical value of this treatment for phosphatic stone I should like to insert here the summary of a personal communication from E. L. Young, Jr. He has had under his care two women with persistent stone formation, accompanied by phosphatic incrustation of the bladder. One of these had had stones removed by cystotomy, but more had formed before the wound had healed. Both had been treated by the administration of sodium acid phosphate to make the urine acid and by the instillation into the bladder of cultures of Bacillus Bulgaricus and of Bacillus Acidophilus, but without marked relief.

Sodium benzoate was substituted for the acid phosphate, calcium lactate in powder form was given and the "antiphosphate" diet was adopted. In one case in which the amount of phosphate in the urine had been studied, the daily output fell from 6 grams per day to 1.2 grams. In two weeks the patient was entirely free from symptoms for the first time in two and a half years, and has remained so ever since (seven months). She has been continuing the diet and bi-weekly instillations of Bacillus Bulgaricus.

The other case has shown a similar improvement, but it has not been checked up by laboratory analyses.

It is the duty of the surgeon, therefore, to supplement by after-treatment and by diet his operative measures employed against renal stone. Every calculus should be analyzed, for it is only through dietary treatment that certain cases of "malignant" stone formation can be offered hope of a permanent cure.

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London Death Rates in January.—During the month of January, 1917, the total death rate of London was 18.4 per thousand inhabitants living. Among the several districts and boroughs the highest rate was 25 in Holbein, a crowded central slum, and the lowest was 14.5 in the financial and business quarter of the city.

ON DISEASE INCIDENCE IN CHINA.

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DISEASE incidence among an ancient isolated people who constitute a quarter of the world's population should in itself be of much interest from a medical standpoint. With the impending industrial and commercial development of the country it becomes a matter of increasing importance to the outside world. Yet it is a subject concerning which there is only the most meager and fragmentary data. Jeffries and Maxwell,[1] in "The Diseases of China," the only comprehensive publication of the subject, state: "Certainly what we have to present is incomplete, and we would make it plain that this is so, and that this chapter is, as it were, but a preliminary presentation of a study which the future must bring to completion." There is, broadly speaking, no medical profession in China, and there are no vital statistics. Practically the only source of first-hand information in regard to disease incidence is from the small handful of western trained medical men working in a few widely scattered, inadequately equipped and understaffed mission institutions.

In the 1914 year book of the missions of China we find that the staff of European physicians of 264 hospitals and dispensaries totalled 300 European men, 135 women and 112 nurses. The Chinese staff consisted of 94 physicians and a group of assistants and nurses of varied and uncertain attainments. During the year 1914, 126,788 in-patients and 2,129,774 out-patients were treated.

Annual reports are available from about 60 of these institutions. Twenty-seven of these include detailed statements concerning the patients treated. Only eight of the reports give a complete list of medical and surgical cases. Successive reports, however, are available from four of the institutions.

As this article is concerned chiefly with the variety and relative frequency of disease conditions, these successive reports will be included. The fourteen annual reports studied deal with 15,800 in-patients, gleaned largely from among 298,436 out-patients in the hospitals, which, with few exceptions, are located in the coast provinces. While the data is obviously too fragmentary to furnish a basis for any conclusions either as to incidence or geographical distribution it, nevertheless, represents the combined experience of some of the foremost medical institutions in China, and thus contributes towards the knowledge of disease incidence as met with in patients in Chinese hospitals.

There are almost as many nomenclatures and classifications of disease as there are reports. There is also a tendency to group diseases under such terms as "various," "others," "miscellaneous," "sundries," etc. A summary of lists of diseases which include such vagaries obviously cannot be accurate. However, as the number of cases so listed is limited, the percentage of error is also small.

Because of the diversity of classification, the cases had necessarily to be grouped. I have classified them under large general headings, and under these they are grouped according to the international classification of disease. The following list (Table 1) gives in actual numbers and percentages the disease incidence under the large general headings.

TABLE I.

	1913-1914* Chinese Hospitals		1913-1914 Mass. General Hospital	
	Cases	Per Cent.	Cases	Per Cent.
1. Specific infectious diseases and general diseases	2,781	17.60	2,120	13.36
2. Diseases due to animal parasites	2,053	13.00	96	0.60
3. Diseases due to metabolism	4		131	0.82
4. Diseases peculiar to infancy	11		105	0.66
5. Diseases due to physical agents	167	1.05	86	0.54
6. Poisonous and intoxications	146	.92	104	0.65
7. Malignant—carcinoma and sarcoma	210	1.32	1,020	6.42
8. Benign	308	1.95	462	2.91
9. Congenital malformations	92	0.60	171	1.08
10. General injuries and diseases of skin and subcutaneous tissues	2,754	17.43	654	4.12
11. Special skin diseases	162	1.03	338	2.13
12. Diseases of circulatory system	139	.90	901	5.77
13. Diseases of the lymphatic system	280	1.77	59	.37
14. Diseases of the blood	272	1.73	130	.82
15. Diseases of the ductless glands	54	.35	155	.98
16. Diseases of the nervous system	333	2.10	732	4.62
17. Diseases of bones, joints, tendons and fasciae	974	6.16	1,288	8.12
18. Diseases of the eye	1,524	9.66	106	.67
19. Diseases of the ear	129	.82		
20. Diseases of the naso-pharynx	26	.16	264	1.66
21. Diseases of mouth, lips, pharynx, tonsils, palate	112	.73	350	2.20
22. Diseases of the jaws, teeth and gums	105	.66	76	.48
23. Diseases of the tongue	1		11	.06
24. Diseases of the esophagus	6		53	.33
25. Diseases of the stomach	207	1.33	388	2.45
26. Diseases of the intestines	213	1.35	523	9.60

* Approximately.

TABLE I—*Continued.*

	1913-1914* Chinese Hospitals		1913-1914 Mass. General Hospital	
	Cases	Per Cent.	Cases	Per Cent.
27. Diseases of the liver and gall bladder	85	.55	443	2.79
28. Diseases of the pancreas	1		14	.08
29. Diseases of the abdomen and peritoneum	203	1.30	824	5.19
30. Diseases of the rectum and anus	575	3.65	298	1.86
31. Diseases of the larynx	1		21	.13
32. Diseases of the trachi and bronchi	172	1.10	111	.70
33. Diseases of the lungs	50	.33	208	1.31
34. Diseases of the pleura and mediastinum	40	.25	183	1.15
35. Diseases of the kidneys and ureters	142	.90	552	3.47
36. Diseases of the bladder	204	1.30	74	.46
37. Diseases of the urethra	127	.80	110	.69
38. Diseases of the male genitalia	385	2.45	257	1.61
39. Diseases of the female genitalia	147	.95	889	5.60
40. Puerperal states	197	1.25	256	1.62
41. Unclassified or ill-defined	401	2.55	306	1.93
	15,795	100.00	15,864	100.00

* Approximately.

The parallel columns give the corresponding figures for a like number of cases (15,864) admitted during 1913 and 1914 to the Massachusetts General Hospital. This hospital also has a majority of surgical cases, and treats similar diseases, with the exception of eye and ear and obstetrical conditions. It, therefore, offers a fairly adequate basis for comparison.

From the above table it will be noted that specific infections and general diseases, parasitic infections, general injuries and infections of skin and subcutaneous tissues, diseases of bones and joints, diseases of the eye and of the rectum and anus, constitute more than two-thirds of the Chinese cases, but considerably less than one-third of the Massachusetts General Hospital cases. If there were at the latter a like number of eye and ear patients, its total would be 38%. The most notable differences are those relating to rectal diseases and parasitic infections, of the combined total of which the Massachusetts General Hospital has only 2.45%, as against 16.6%. Specific infections and general diseases and diseases of the bones and joints make up more than 20% in both.

The other most striking disproportions are of primary diseases of the blood and of metabolism, of which the Chinese hospital reports include only two and four cases respectively. In diseases of the circulatory and digestive system, kidneys and ureters, female genitalia and malignant disease, there are only from 16 to 33% as many Chinese as there are Europeans. About 60% of the European cases of disease of the liver and gall-bladder are cholelithiasis and 6% cirrhosis. Among the Chinese about 43% are of cirrhosis and none of gallstone.

Further analysis shows that in some instances the difference as to organic disease is even greater than the figures indicate. About 85% of the diseases of the stomach and of the intestines, for example, are classified as indigestion, gastritis, diarrhea, etc., while in the Massachusetts General groups only about 15 and less than 1%, respectively, are so diagnosed.

The relative incidence of disease is given in two-thirds of the Chinese cases.

TABLE II.

SPECIFIC INFECTIOUS DISEASES AND GENERAL DISEASES.

	Cases	Approx. Per Cent.
Tuberculosis		22
Pulmonary	141	
Abdominal	31	
Pott's disease	15	
Of the joints	164	
Of bone	39	
Of the skin	65	
Of the lymph nodes	129	
Of the genitals	12	
Unclassified	8	
Syphilis	582	21
Gonococcus infection	386	14
Enteric infection		15
Typhoid	198	
Paratyphoid	25	
Dysentery—cause unknown	176	
Amoebic dysentery	17	
Bacillary dysentery	11	
Balantidic	1	
Miscellaneous infections.		
Trachoma	276	10
Beri Beri	166	6
Chronic infectious arthritis	157	6
Purulent infections.		
Septicemia, pyemia	50	2
Relapsing fever	35	1
Pneumonia	37	1
All others	60	2
TOTAL	2781	100

Tuberculosis and venereal disease constitute 57% of the cases. Enteric infection, beri beri and arthritis bring the total up to 84%. Of the tuberculous infections, those of the bones and joints total 34%, those of the lungs 23%. It seems probable, however, that a much larger proportion of patients with bone and joint disease than with pulmonary disease seek medical advice.

Of the venereal patients 60% are luetic. The stage and part affected is, for the most part, unspecified. "Buboes" make up 60% of the nonluetic venereal cases. A little more than 50% of the enteric infections are of the typhoid group. Pneumonia seems rare as compared with its incidence among Europeans. Trachoma and beri beri, on the other hand, constitute almost a

sixth of all the cases. Under the unclassified group is included mostly the epidemic diseases, which appear to be infrequent from the fact that they are not, as a rule, treated in a general hospital. There are, for example, only 19 cases of leprosy included, but the general impression as to its frequency is expressed by Jeffries and Maxwell: "Leprosy is smeared over the face of China like butter on bread—not in spots, but found just about everywhere." Smallpox is also very prevalent. During the decade ending in 1915 there was in Shanghai an average of 200 deaths per annum (1 in 3000) among the Chinese, and 9 per annum (1 in 2000) among the Europeans and Japanese from this ancient malady. Epidemics of cholera and of bubonic plague occur mostly in the south. In the annual report of the Foochow Hospital[3] is this statement: "Again, as in former years, thousands of the city's teeming population have succumbed to the awful ravages of the plague. It seems impossible to get at exact numbers. The Chinese themselves merely approximate the reckoning by counting the number of coffins that pass through the city gates on some one day and multiply the number by the days of the summer season."

There are very few recorded cases of the exanthemata. Stanley[4] writes, "Scarlet fever was practically unknown in Shanghai prior to 1900, and was probably introduced by foreign immigrants."

The relative incidence of the communicable infectious diseases in the Isolation Hospital, Shanghai, 1915, was as follows:

TABLE III.

	Foreigners, including Japanese		Chinese	
	Admitted	Died	Admitted	Died
Smallpox	56	19	36	15
Cholera	0	0	0	0
Diphtheria	33	2	36	6
Scarlet fever	38	1	89	22
Tuberculosis	0	0	6	1
Plague	0	0	0	0
Measles	22	2	21	2
Relapsing fever	0	0	9	0
Beri Beri	0	0	23	3
Leprosy	0	0	2	0
Syphilis	0	0	2	0
Chancroid	0	0	6	0
Gonorrhea	0	0	236	0
Other diseases	29	1	467	6
	178	25	933	55

Population: foreigners, 18,000; Chinese, 600,000.

There are 35 cases of relapsing fever and 5 of typhus fever. Only 9 instances of tetanus are reported, which seems remarkable considering the relatively large amount of traumatism and the abundant opportunities for soil infection. There are three cases of anthrax. (Further typical cases are recorded in other reports.) There was doubt up to a few years ago as to the existence of this infection among the Chinese. In view of the most recent work on anterior poliomyelitis, it seems remarkable that there should be only one case of the disease—this one showing anterior horn lesion at autopsy. Kala-azar is reported as prevalent in some quarters. Rabies, while not included in the reports, is common in Shanghai. In 1915, "70 people were given the Pasteur treatment, in 37 of which the animals were proven rabid by inoculation."[5]

TABLE IV.

DISEASES DUE TO ANIMAL PARASITES.

	Cases	Approx. Per Cent.
Ascariasis	876	43
Uncinariasis	451	22
Faciola	284	14
Triococephalus	215	11
Malaria	116	5
Schistosomum japanicum	7	1
Ringworm	5	
Others	9	
Unclassified	90	4
	2053	100

Inasmuch as 866 of the cases of ascariases and 371 of uncinariasis were reported from one hospital, these figures are not representative. However, that in China, he who seeks for parasites finds, is indicated by the comment in this hospital report[6] on the increased number of these cases. It is stated that it was due to "a more careful and systematic search." One Shanghai hospital reports:[7] "Out of 756 patients examined, only 323 were found to be free from intestinal parasites, *i.e.*, 57.3% infected, 42.7% free."

Of parasitic infections which seem endemic to certain areas may be mentioned kala-azar, peragonium westermanii, schistosomum japanicum, fasciolopsis buski and clonorchis sinensis. Goiter and vesical calculus also seem endemic to certain sections.

TABLE V.

GENERAL INJURIES AND DISEASES OF THE SKIN AND SUBCUTANEOUS TISSUES.

	Cases	Approx. Per Cent.
Wounds	874	33
Abscesses	582	21
Ulcers	846	31
Contusions	269	10
Sepsis cellulibs, etc.	89	6
Carbuncles, furuncles	75	
Gangrene	19	0
	2754	100

It will be noted here that trauma constitutes 42% of all cases; and infections, excluding ulcers, 27%. About a third of the cases of trauma are gunshot wounds in soldiers. Excluding these, there are almost as many cases of infection as of trauma. The nature and site of ulcers is not stated. Regarding them Jeffries and Maxwell[8] write: "Probably every form of leg ulcer known to man is found in this land . . . The majority are probably gummatous, with varicose a good second." Eggers[9] calls attention to the occurrence of spirochetes and a

fusiform bacillus in the phagedenic "tropical" ulcer, occurring especially in Central China.

TABLE VI.

DISEASES OF THE BONES AND JOINTS.

	Cases	Approx. Per Cent.
Fractures	420	23
Necroses and osteomyelitis	347	36
Dislocations	110	11
Other joint diseases	97	10
	974	100

These cases are exclusive of 218 cases of tuberculosis of bone. Fractures and dislocations make up more than half of all the cases. Of the fractures, two-thirds are of the lower extremity, and are equally divided between femur and leg. There were seven cases of dislocation of the hip. The bones affected in necrosis are for the most part not stated. Ankylosis and arthritis make up most of the joint cases. The elbow and knee seem most often affected.

TABLE VII.

DISEASES OF THE EYE.

	Cases	Approx. Per Cent.
Cataract	235	15
Entropion	222	15
Conjunctivitis	211	14
Trichiasis	119	8
Pterygium	117	8
Corneal ulcer	102	6
Keratitis	80	5
Leucoma	54	4
Chalazion	32	2
Blepharitis	32	2
Scleritis	26	2
Hordeolum	22	1
Glaucoma	17	1
Amaurosis	17	1
Iritis	15	1
All others	223	15
	1524	100

Trachoma, included under specific infectious diseases, numbers 276 cases. Cataract is not as common as in other Oriental countries, notably India. Cataract, entropion and conjunctivitis make up 44% of the total. Maxwell[10] says: "Every form of conjunctivitis that we know of is found," and "that for entropion is one of the commonest operations we are called upon to perform in China."

It may be of interest to consider some of the most striking relationships brought out in the groups constituting the remaining one-third of these 15,800 hospital patients. There are recorded under diseases of metabolism only three instances of diabetes mellitus and one of scurvy. Reed,[11] however, from replies received to a questionnaire, sent to 150 Western trained physicians, concludes that "it (diabetes mellitus) will be found increasingly prevalent in China as observation is extended to the better class of society." Most of the lesions caused by physical agents, excluding mechanical trauma, are due to burns. Only six cases are recorded. When one considers the precautions Europeans are forced to take against the intense sunlight, this seems remarkable. The Chinese go about bareheaded with impunity. The cases of poisoning are mostly attempted suicides; opium was the drug used in half of 146 recorded cases. The number of opium suicides is said to be decreasing markedly with the increasing difficulty in obtaining the drug. An increasing number are using the inorganic acids, kerosene, salt, nux vomica, gamboge and gold rings. There are only two cases of chronic alcoholism.

TABLE VIII.

THE DISTRIBUTION OF 224 CASES OF MALIGNANT DISEASE IS AS FOLLOWS.

	Cases	Approx. Per Cent.
Breast	26	12
Stomach and liver	12	6
Male genitals	12	6
Peritoneum, intestines, rectum	9	4
Skin	9	4
Buccal cavity	8	4
Female genitals	7	3
Urinary organs	1	0
Unclassified	126	60
	210	

Incidence and mortality from malignant disease are almost synonymous terms in China, where so few apply for surgical relief, even in the late, hopeless stage. It is, therefore, of interest to consider the death rate as found in the available health reports. Hoffman,[12] in a study of cancer mortality throughout the world for 1908-1912, groups the cases as follows:

TABLE IX.

MORTALITY FROM CANCER IN THE REGISTRATION COUNTRIES OF THE WORLD, 1908-1912.

Continent	Population	Deaths from Cancer	Rate per 100,000 Population
Africa	9,041,866	3,018	33.4
America	382,549,311	251,438	65.7
Asia	272,814,926	148,447	54.4
Australia	27,886,740	20,345	73.0
Europe	1,431,996,961	1,026,716	76.6
	2,124,289,740	1,519,964	71.6

TABLE X.

THE MORTALITY FROM CANCER IN THE COUNTRIES OF ASIA.

	Population	Deaths from Cancer	Rate per 100,000 Population
Ceylon	70,076,320	1,133	5.6
Hongkong	1,737,310	140	8.1
India	4,456,200	522	11.7
Japan	242,460.425	145,965	60.2
Penang	1,291,689	143	10.3
Philippines	1,190,154	325	27.3
Shanghai	68,684	38	55.3
Singapore	1,434,780	181	12.6
	272,814,962	148,447	54.6*

* The data are given for Ceylon, 1907-1911; for Hongkong, 1907-1911; for India, City of Calcutta, 1908-1912; for Japan, 1905-1909; for Penang, 1909-1913; for Philippine Islands, City of Manila, 1909-1913; for Shanghai, 1909-1913 (Europeans only); for Singapore, 1906-1910.

These figures, the author points out, are tentative and trustworthy only in an approximate sense. They would seem especially so for Asia. It will be noted, for example, that the proportion for this continent is based on 148,447 deaths. 145,965 (98.4%) of which are Japanese. For China the estimate would have to be derived from 140 deaths, one in 3,000,000. Generally speaking, cancer mortality appears highest in those countries and in those particular localities in which modern medicine has reached its highest development.

The tables would seem to indicate that practically nothing is known as to the actual incidence of malignant disease among the Chinese, and it represents the extent of our exact knowledge of disease incidence in general in China.

Some estimate of the relative incidence by organs may be gained from the following:

TABLE XI.

MORTALITY FROM CANCER BY ORGANS.

ORGANS OR PARTS	CHINA*	HONGKONG	JAPAN	PHILIPPINES	INDIA CEYLON	UNITED STATES
Buccal cavity	3.8	6	2.3	14.6	31.9	3.9
Stomach and liver	5.7	30	61.2	20.2	25.2	25.59
Peritoneum, intestines and rectum	4.3	6	5.3	7.5	1	13.27
Female genital organs	3.3	12.6	15.8 (31.1)	18.1	3.7	15.43
Female breast	12.4	5	1.3	8.5	3.8	9.2
Skin	4.3	2.5	1.1	0.3	2.2	3.45
Other or not specified	66.3	37.7	13	28.1	31.7	15.12
All organs	100.1	99.8	100		99.5	100
CASES	210	119	65,284	293	1323	76,319

* Incidence.

YEARS: 1913-1914, 1895-1914, 1909-1910, 1908-1913, 1911-1913, 1913.

It is of interest to note in passing the extraordinary disproportion in the incidence of carcinoma of the stomach and breast among the Japanese, as compared with that in the United States, and as compared with the available figures for China. The Japanese would seem to have ten times the incidence of gastric cancer of that found for China, and twice that for the United States. On the other hand, the Japanese seem to have only one-fourth and one-third as many cases of carcinoma of the breast. The proportion of cases affecting the female genital organs appears the same for Japan as for the United States.

TABLE XII.

THE 308 CASES OF BENIGN GROWTHS ARE CLASSIFIED AS FOLLOWS.

Sebaceous cyst	33
Lipoma	30
Fibroma	21
Cysts (unclassified)	21
Nasal polypi	21
Granulomata	16
Epithelioid	14
Myoma	14
Adenoma	14
Papilloma	9
Dermoid	8
Teratoma	8
Ovarian cyst	7
Osteoma	6
Angioma	5
Hydroma	3
Unclassified	78
	308

Harelip constitutes 60% of 92 cases of congenital malformations. There are 9 cases of imperforate anus. Fifty-four per cent. of the skin cases are of eczema. There are 12 instances of dermatitis, 9 each of impetigo contagiosa and erythema multiforme. No especially rare skin diseases are represented.

There are 139 cases of disease of the circulatory system. Of these, 20% are of mitral insufficiency, 20% endocarditis, 19% organic heart disease, and 10% aortic insufficiency. There are 15% of aneurysm and one case of Stokes-Adams disease.

Under diseases of the blood, 270 cases are classed as "anemia" and one case each of sclerosis and myeloid leukemia.

Of the 54 cases of disease of ductless glands, 43 are of splenomegaly, 4 goiters and 2 of hyperthyroidism. The others are ill defined.

There are 333 cases of disease of the nervous system. Almost half of these are classified as cerebral concussion. There are 38 of cortical hemorrhage, 24 of neuritis, 11 each of vertigo, insanity and neuroses, and 8 of migraine. There are 2 each of tabes, paresis, spastic paraplegia, lateral sclerosis, multiple sclerosis and brain tumor. It may be of interest to note here that in one clinic exclusively for mental disorders, of 327 cases 33% were manic-depressive, 26% dementia precox, 15% general paresis, and 5% alcoholic psychoses.

Tonsillitis makes up about half of the diseases of the nose and throat, with peritonsillar abscess, pharyngitis and stomatitis making up most of the balance. Necroses and defective teeth constitute practically all cases of disease of the jaws.

Gastritis, dyspepsia and indigestion include 85% of the 207 cases under diseases of the stomach. There were 12 cases of cancer of the stomach included under malignant disease. Twenty-four (11.6%) were of peptic ulcer, one perforative with recovery following operation.

Of 213 cases of diseases of the intestines, 87% are classified as diarrhea, constipation or intestinal colic. About 8% are appendicitis.

Forty-three per cent. of 85 cases of diseases of liver and gall-bladder are grouped under cirrhosis and 26% under abscess. Seven are diag-

nosed jaundice and two cholecystitis. There is not a case of cholelithiasis.

Of 203 cases of disease of the abdomen and peritoneum, 70% are diagnosed ascites. Twenty-six per cent. are of herniae and 4 of peritonitis.

Sixty per cent. of 262 cases of disease of the respiratory system are of bronchitis, 11% pleurisy, 9% asthma, and 3% empyema. Most of the remainder are set down as "disease of the lungs."

Nephritis and a small, unclassified group make up the total of 142 cases of renal disease, except for 2 each of floating kidney and hematuria, and one each of pyonephrosis, pyuria and calculus. Vesical calculus constitutes 63% and "urinary retention" 26% of the diseases of the bladder. Practically all the cases of lesion of the urethra, except 9 of stone, are due to stricture. Phimosis and balanitis make up almost 90% of the cases of the lesions of the male genitalia.

The 123 cases of gynecologic conditions are made up of a few each of the commoner lesions, of which relaxed perineum is the most frequent. Of 195 cases of puerperal states, about two-thirds were normal labors, 10% were abnormal labors, and there are a few cases each of adherent placenta, placenta previa and puerperal fever, and one each of tubal pregnancy, phlegmasia alba dolens and ruptured uterus.

Fewer of unknown cause, debility, "various" and "unclassified" make up most of the 470 cases under the group of ill defined or unclassified diseases.

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LIPOMA OF THE INTESTINE.

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THE principal benign tumors of the gastro-intestinal tract are lipoma, fibroma, myoma and adenoma. They are relatively uncommon. Lipoma, which occurs most often, arises from the adipose tissue of the submucosa. It may be pedunculated or sessile. Though usually single, four cases of multiple tumors have been reported. That of the ileum is, as a rule, about the size of a walnut, whereas the lipoma of the sigmoid or rectum may grow as large as an apple. The tumor almost always retains its submucous situation. Subserous lipomata are rare, and should be discriminated from a pseudo-tumor, described originally by Virchow, which is merely an elongated and hypertrophied appendix epiploica. Through torsion, or atrophy of the pedicle, the tumor may become detached, continuing its existence as a free body within the peritoneal cavity. Clinically, pseudo-lipomata are unimportant. In a case reported by Hahn, however, one slipped through an adventitious opening in the transverse meso-colon and caused intestinal strangulation.

Hensel has collected 71 cases of gastro-intestinal lipomata, discovered at operations, autopsy, or by spontaneous extrusion, as follows: operation, 39; autopsy, 21; and spontaneous extrusion, 11. The anatomic distribution was as follows: stomach, 3; duodenum, 6; jejunum and ileum, 21; large intestine, 39; locations not given, 2; total, 71.

In addition to its academic interest, the subject of intestinal lipoma has a surgical significance, owing to the co-existence with intussusception. The frequency of this combination is demonstrated by the statistics of Treves, which show that lipoma is found in 8% of the cases of intussusception. Wichman, in studying 131 cases of intussusception, discovered 11 cases of lipomata; and Stetten, in his analysis of 67 cases of gastro-intestinal lipomata, discovered intussusception in 60% of the cases.

In an extensive study of tumor-intussusception, Kasemeyer presents the abridged histories of 284 cases. There were 85 malignant and 192 benign tumors. In the adult, intussusception is also related to those inflammatory conditions which simulate a tumor. The analysis of 284 cases gives the following figures:

A.	Carcinoma	49
	Sarcoma	26
	Epithelioma	3
	Malignant tumors without definite diagnosis	7
	TOTAL CASES	85
B.	Tumors without a biological diagnosis	7
C.	Benign tumors (or tumor-like conditions) Polypi	60

Adenoma	13
Lipoma	20
Fibroma	6
Myo-glioma	2
Papilloma	4
Inverted appendix	18
Inverted diverticulum	42
Tuberculosis	8
Inflammatory tumors (nature not given)	7
Angioma	1
Cyst	1
Foreign body	1
TOTAL CASES	192

A case in point is the following, which came under the writer's care and observation in the Second Surgical Division of Fordham Hospital (Service of Dr. John J. McGrath):

F. S., age 50, was admitted December 22, 1915. The patient was moderately alcoholic; had no diseases of childhood; denied venereal disease; and had had no previous illness or attack similar to the present.

The present illness began two weeks before the day of admission with a sudden sharp pain in the epigastrium. The pain rapidly radiated to the lower right quadrant. The pain lasted but a short while. It soon returned, however, only to disappear soon again. Then colicky attacks occurred every day. They increased in severity and frequency until the day of admission. Vomiting took place several times. The bowels moved with purgatives and enemata.

Physical examination showed a well-developed man. The pupils were equal and reacted to light and accommodation. The tongue was coated and moist. The heart sounds were clear and strong. The arteries were somewhat thickened, though the pulse was regular and the tension about normal. The lungs were negative.

Abdominal examination disclosed a sausage-shaped mass in the lower right quadrant. Tenderness was readily elicited over the mass. Slight tenderness existed in the epigastrium. Moderate distention. No rigidity. Rectal examination negative. Modified tympany over the site of the mass.

The urine was cloudy. Specific gravity, 1028; acid in reaction; a slight trace of albumen; no sugar; and an occasional hyaline cast. Leucocytosis, 19,600; polymorphonuclears, 85%; transitionals, 1%; lymphocytes, 13%; and the large mononuclears, 1%.

A tentative diagnosis of acute appendicitis was made, and an immediate operation proposed.

Operation (December 23, 1915, Dr. A. H. Harrigan). Ether narcosis. The abdomen was opened through a right rectus incision. The appendix was easily delivered and found to be normal. Thereupon the entire mass occupying the iliac fossa was brought forward and analyzed. It was found to be an ileo-colic intussusception. The ileum had passed through the ileo-cecal valve, entered the cecum, and passed half way up the ascending colon. By palpation throughout the wall of the cecum could be felt a small, hard mass about the size of a marble. The intussusception was reduced by manual traction, though with difficulty, for the ileum was markedly edematous. Following the reduction, the ileum was carefully examined and, at a point four and one-half inches from the ileo-cecal valve, a small tumor could be felt lying within the lumen of the intestine. The ileum was opened by an incision transverse to the long axis. The incision was placed directly over the tumor, which was found to be a pedunculated growth arising from the mucosa on the mesenteric border. The pedicle was ligated with catgut and the tumor removed. The mucous membrane at the base was brought together with catgut. The opening in the intestine was closed with linen. Three rows of sutures were used. The abdominal incision was closed in layer fashion. No drainage.

The post-operative course was exceedingly serious. A severe broncho-pneumonia developed, which, however, he passed through in splendid shape. There was a superficial infection of the suture line, which rapidly healed. The patient was discharged February 2, 1916, in excellent condition. Several months later the writer presented the patient before the Surgical Section of the Academy of Medicine. He is now in excellent health, and has no return of the symptoms.

Pathological examination (No. 5543, Fordham Hospital) demonstrated a lipoma. The tumor after removal measured 6 cm. by 6.5 cm.

As the subject of intestinal lipoma is intimately related to that of tumor intussusception, a cursory review of intussusception in general is presented in order to complement the discussion.

It is not clearly understood how and by what means intussusception is produced. Though various theories are extant, the subject remains unsolved, though it is evident that the condition arises from an error or anomaly of peristalsis.

J. E. Peyer, the first to view intussusception as a special form of intestinal obstruction, formulated a theory to explain its occurrence. He believed that a short part of the intestine becoming paralyzed took within itself, as it were, the portion of intestine lying immediately above, which previously had become narrowed from excessive peristaltic contraction. This theory received general recognition for many years. There is no question that local intestinal paralysis may be a decisive factor in the production of intussusception. Indeed, this possibility is conceded by Nothnagel. There is, however, no evidence, experimental or clinical, to support Peyer's theory.

The views of Nothnagel, which are directly opposed to those of Peyer, were based on the results of carefully considered animal experiments. He found that electrical stimulation of the intestine of the rabbit caused a ring-like contraction. Rapidly following this, the intestine below this point turns up and curls over the contracted part, like an inverted umbrella. Invaginations have been obtained which measured several centimetres in length and which continued ten minutes. Wilms, who is a strong supporter of Nothnagel's theory, believes that the ring-like contractions furnish a fixed point over which the longitudinal fibres are able to act. This experimental work of Nothnagel should be repeated in view of the present knowledge of peristalsis furnished through the recent investigations of Bayliss and Starling.

Several of the older writers—Dance, Cruveilhier, Brinton and Bristow—believed that intussusception was initiated by a spasm or tetanic contraction of a limited portion of the intestine, the contracted part in turn being driven by active peristalsis into the segment below. Brinton emphasized the importance of the longitudinal fibres, which he believed aided greatly in pulling the contracted part.

According to some authors, the spastic theory fails to explain satisfactorily all varieties of intussusception. This view is strengthened by a study of the cases of annular carcinoma, sarcoma, and infiltrating tuberculosis of the intestine, associated with intussusception. As Kasemeyer pointed out, these diseases tend to produce a marked intestinal rigidity, which should make an additional contraction or narrowing remote or impossible. The usual interpretation of this event is that vigorous peristalsis drives the rigid diseased portion down into the normal intestine, where it is firmly held.

With certain tumors, as lipoma, myoma or polypi, the mechanism of intussusception is simple. It is believed that the tumor, from its submucous situation and form, may act like a foreign body and evoke powerful peristalsis, which forces the tumor down into the intestine below, where the circular muscle fibres seize and hold it firmly, provided peristalsis is continuous. Naturally, that part of the wall of the intestine which corresponds to the base or point of attachment of the tumor is invaginated into the intestinal canal so as to cause a funnel-shaped depression of the intestinal wall. If peristalsis is powerful and the pedicle relatively weak, the tumor may become detached and subsequently expelled. This explains the cases of spontaneous extrusion.

Fuchsig described the formation of this funnel-shaped depression as seen by him during the course of an operation. Smolie, during the course of an operation for a polypoid adenoma of the ileum, was able to manipulate the tumor so as to reproduce at will the characteristic funnel-shaped depression. Ewald and Salomon furnish additional evidence, the latter offering definite post-mortem verification.

This mechanism of tumor intussusception explains certain variations in the clinical picture. Many cases present a temporary abatement or cessation of the symptoms, which indicates partial or complete relief of the obstruction. In considering the mechanism of tumor-intussusception, it was assumed that the subjacent intestine held the tumor firmly. It is reasonable, however, to suppose that the tumor occasionally escapes from the grip of the intestine, permitting thereby the invaginated part to resume its normal position. The occurrence of these abortive attacks would easily explain the intervals of freedom so frequently noted in the case histories.

Stenosis seems inevitable if the lipoma reaches an appreciable size. That this complication does not occur oftener is due, most likely, to the elasticity and dilatability of the intestine. Moreover, the ease with which the tumor can be displaced aids in permitting a free fecal current.

In general, the existence of intestinal obstruction furnished the indication for operation in most of the cases operated upon. The presence of an abdominal tumor determined operation in a few instances.

The symptoms of intestinal lipoma are necessarily vague and variable, according to the location and size of the tumor. Stenosis from obstruction would appear to be rare. The treatment of lipoma is practically that of tumor intussusception. Spontaneous cure by extrusion is uncertain and dangerous, as perforative peritonitis has resulted. The irrigation treatment is of no avail.

The procedure employed varies according to the site of the lesions; also, the condition of the patient may affect the nature and type of the operation employed. A patient extremely toxic from prolonged obstruction may permit but a modified operation. Among the operations available are manual reduction, enterostomy, enterotomy, and intestinal resection in one or two stages.

In general, the principles underlying the treatment of acute intestinal obstruction are here effective.

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MEDICAL SOCIETY OF THE MISSOURI VALLEY.—The twenty-eighth semi-annual meeting of the Medical Society of the Missouri Valley was held in Keokuk, Iowa, on March 22 and 23. The program consisted of twenty papers on medical and surgical subjects, exclusive of addresses.

A CONTRIBUTION TO VEGETATIVE NEUROLOGY: TOUCHING UPON HEART ACTION, STATUS-LYMPHATICUS, AND SO-CALLED VAGATONIA AND SYMPATHICATONIA.

BY EDWARD A. TRACY, M.D., BOSTON.

ON stroking the skin of the normal individual there appears a brief vaso-dilation of the underlying blood vessels, followed in about fifteen seconds by a vaso-constriction that lasts a few moments. This has been found to be the normal reaction of the skin to stroking.[1] The vaso-constriction component of the normal reaction has been shown to be due to stimuli coming over the sympathetic fibres together with adrenin in the blood stream,[2] and as it is this finding which is the principal basis of the present contribution to vegetative neurology, it shall be herein considered in some detail.

Physiologists teach us that adrenin is a substance secreted by the suprarenal glands, given off constantly to the blood stream,[3] and that it is readily osmosible.[4] It has a very strong attraction for smooth muscle tissue, and when it comes into conjunction with the latter, puts it into tetanoid contraction. Both the facts of its ready osmosis and its tetanoid contraction producing property, when in conjunction with smooth muscle tissue, we can readily demonstrate upon ourselves by injecting subcutaneously a drop of adrenin solution into an arm. Shortly after making the injection, the skin over its site will be seen to blanch, due to the intense contraction of the local blood vessels. At first there is no sign of the pilo-motor muscles being involved, but a little later the pilo-motor muscles in the blanched area will go into tetanoid contraction, due to the adrenin reaching them by osmosis. After an hour or more, the blanching disappears and the skin becomes quite normal.

What are the changes that have taken place in the tissue involved? So far as I know, physiology does not teach us. But it seems probable that adrenin has an intense attraction for some constituent of smooth muscle tissue, and that when conjunction occurs, these substances unite to form a new compound that gives the character of tetanoid contraction to smooth muscle tissue. This new compound after a while osmoses out of the smooth muscle tissue, and the smooth muscle becomes as it was before the addition of the adrenin. What this compound may be, it is for the chemist to determine. All that we can say is that adrenin disappears in the process of performing its functions in the body. Knowing the tetanoid-producing action of adrenin on smooth muscle tissue, this action will now be considered in relation with reflex vaso-constriction—the vaso-constriction resulting from stroking the skin. As previously stated, the skin of a normal individual, when stroked, gives the reaction of vaso-constriction, this appearing as a whitish streak (in Caucasians). The writer found some patients in which no reflex vaso-constriction appeared after stroking. These patients, a few minutes after having had injected into them, therapeutically, a dose of adrenin, gave the reaction of vaso-constriction when again stroked. Let us consider attentively the phenomena in these cases. Stroking causes more stimuli to flow over the nerves concerned in the phenomena, that is, it increases the tonus of the sympathetic fibers—if we regard the tonus of a nerve to measure the amount of stimuli going over it. In the cases mentioned—those of patients without the reflex of vaso-constriction to stroking—we could increase the tonus of the nerves, that is, increase the stimuli flowing over them, as much as is possible by stroking, and yet no vaso-constriction resulted. In other words, increasing the tonus of the sympathetic nerve fibres—the nerves concerned in vaso-constriction—does not cause vaso-constriction. The same patients, shortly after having had an injection of adrenin, gave the reflex-vasoconstriction on stroking. The only change in the conditions was the addition of adrenin to the blood stream. It must be granted, therefore, that reflex vaso-constriction is caused by increase of nerve stimuli plus adrenin in the blood stream.

The stroking of the skin increases the flow of stimuli over the sympathetic fibres and, as a result of this increase, the smooth muscle tissue of the blood vessels takes up adrenin from the blood stream and goes into tetanoid contraction. Without the increase of nerve stimuli the adrenin remains in the blood, and no tetanoid contraction of the blood vessels' musculature occurs. Knowing the attraction that exists between smooth muscle tissue and adrenin, we can liken this feature of the phenomena of reflex vaso-constriction to oxygen and hydrogen gases in a container, their conjunction or union—the explosion—is lacking, until a spark be applied. We can regard smooth muscle tissue as containing a substance that has such an affinity for adrenin that under appropriate conditions a like explosion or union will be effected. The current that causes this union is the increased nerve current—stimuli—coming over the sympathetic fibers, whose endings touch both muscle fiber and adrenin.[5] Or we may consider the neuro-muscular end-plates as doors that open for the admission of adrenin into the smooth muscle fibers. The doors are opened as long as nerve stimuli flow over the nerve; the greater the amount of stimuli the more open is the muscle fiber to let in adrenin from the blood stream. Analogies such as these are intended simply to aid us in the conception of the phenomena. What appears to be probable is this: two substances having a chemical affinity for each other are brought together, a new substance formed, and energy set free in the process, all occurring under the control of the stimuli—nerve current—

coming over the sympathetic nerve fibers. From a study of the phenomena of reflex vaso-constriction it may be deduced that vaso-constriction is caused by stimuli coming over the sympathetic nerve fibrils acting on the hormone adrenin and the smooth musculature of the blood vessels. Reasoning from analogy, we may state that vaso-dilation is caused by stimuli coming over the autonomic fibers and acting upon the hormone *x* and the musculature of the blood vessels, as a result of which the musculature actively relaxes or dilates. Hormone *x*, (so termed because it has not been identified by physiological chemistry), and called by Eppinger and Hess "autonomyn," comes mainly, it appears to me, from the thyroid, because I have noticed that thyroid extract, when fed to patients, increases the reflex vaso-dilation, and also that this reflex is increased in Graves' disease (hyperthyroidism). Confirmatory of this view is v. Cyon's experimentation on thyroidless animals. He found a diminution of the excitability of the vagi to electrical stimulation in such animals.[6] It is probable that the anterior hypophyseal tissue and the thymus also give hormone *x* to the blood stream.

With this view of the relation of vegetative nerve stimuli and hormones in mind, how interesting does the action of the heart appear. The heart may be considered as a mass of muscle tissue reacting to its vegetative nerve supply and the hormones in the blood stream just as the musculature of the blood vessels reacts to the same nerve supply and the same hormones. The autonomic nerves, together with hormone *x*, cause the heart to dilate, and just as in the blood vessels of the skin, this dilation is an active process. The sympathetic nerves of the heart, with the hormone adrenin, cause the contraction of the heart, due apparently to the chemical decomposition of adrenin, caused and controlled by the stimuli coming over the sympathetic fibers. The musculature of the heart differs somewhat from that of the blood vessels; this differentiation may be due to the necessity of a speedier combustion of the hormones *x* and adrenin to produce the active dilations and contractions that mark the working of this most powerful organ. This view of heart action explains the occurrence of death in status thymolymphaticus, the cause being superabundance of hormone *x* in the blood and insufficiency of adrenin. The dilation of the heart is provided for, but the insufficiency of chromaffin tissue causes lack of adrenin, without which the heart cannot contract, no more than, as we have seen, the blood vessels can. Cases of status lymphaticus may be benefited by adrenin treatment, and, I believe, operations undertaken on patients in this condition will be safer if adrenin in the blood stream be provided for. Such cases may be diagnosed by absence of anemic dermography, showing lack of adrenin in the blood stream.

It seems to the writer that Eppinger and Hess, in their splendid contribution to clinical medicine entitled "Vagatonia," are hampered by their conception of vegetative nerve tonus.[7] In their book a hypertonic condition of the vegetative nerves is assumed in order to explain their clinical observations. No proof, however, is given that the nerves are really hypertonic, that is, carry more stimuli from their nuclei than normal nerves. As has been shown, increasing the tonus of the sympathetic fibers, causing more stimuli to flow over them, produces no result without the presence of a sufficiency of adrenin in the blood vessels innervated by these fibers. The conditions of patients described in the literature as vagatonia and sympathicatonia appear, in the light of experimentation and observation herein described, not to be due to an increase of tonus of the nerves involved, but in reality are due to a hyper-content of one or both hormones, the tonus of the nerves being normal. I would except the psychopathic cases[8] in which Eppinger and Hess noted astonishing reactions of both branches of the vegetative system in their clinical tests with pilo carpine and adrenin. With the brain—the center from which stimuli originate—diseased, it can readily be comprehended that a variation from the normal tonus of these nerves, that is, a variation in the amount of stimuli coming over them, might be expected. In point of fact, I have observed a demonstrable change of tonicity of the vegetative nerve fibers in cases in which the brain was evidently diseased.

It appears probable that the vegetative nervous system in normal condition conveys stimuli from the brain centers to their end organs, and that these stimuli act on the chemical compounds termed hormones, in the blood stream, so that new compounds are formed. In the formation of these compounds energy is set free that produces mechanical work, or the compounds formed are the assimilatory or dissimilatory compounds necessary for the accomplishment of normal metabolism. If the hormones are in excess of the normal amount (we can readily cause an excess by injecting pilocarpine, the analogue of hormone *x*, or by injecting the hormone adrenin), the resulting effects can be attributed to this excess of the relative hormone, without assuming to be present an abnormal tonus of the vegetative nerves involved. A demonstration of the truth of this view for the autonomic nerve fibrils is witnessed when we inject subcutaneously a drop of pilocarpine solution. The skin, locally, about the site of the injection, reddens and sweats (small, glistening points are seen, and moisture is felt if we pass a finger over the area). In this case the tonus of the autonomic fibers is evidently the same as before the injection, but the analogue in action of hormone *x*—pilocarpine—is in excess locally in the blood.

Constant abnormal tonus in the nerves (excluding that from drug action) is a serious con-

dition, implying organic disease, and should not lightly be invoked to explain clinical conditions that may be more rationally explained on the basis of the observations and experiments described in this paper.

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THE CAUSE OF POLIOMYELITIS.

BY HORACE GREELEY, M.D., BROOKLYN, N. Y.

IN a recent article* I briefly described bacteriological work showing that the organism found in the brains and cords of cases which succumbed to our recent epidemic of poliomyelitis, was a bacillus of the group known to cause distemper in many of our domestic animals. That while by a number of bacteriologists the organism had been described as a streptococcus it could, at will, be transformed to a bipolar, spore-forming bacillus and then again be made to assume the streptococcus formation.

The streptococcus form appears when the organism is cultivated in blood serum, and the bacillus form when cultivated on solid Loeffler blood serum the surface of which is watered (wet) with a mixture of blood serum and bouillon containing limewater. Replants from the latter, on plain Loeffler blood serum without wetting, continue to show the bacillus form, which is also the case in bouillon.

In the streptococcus form the organism is Gram-positive, except in old cultures when vacuolization tends to make some individuals appear Gram-negative. In the bipolar bacillus form, as produced on the watered cultures, the poles alone are Gram-positive. Replants on plain solidified Loeffler blood serum and in plain bouillon may be grown in which all the bacilli are Gram-negative. In the latter the organism is motile and shows a single flagellum. Cultures developed according to the technic of Flexner and Noguchi showed the pleomorphism described by them, but when treated as decribed above developed into pure cultures of the bacillus.

In order to compare the bacillus isolated with the "streptococcus-like" organism described by Dr. E. C. Rosenow (*J. A. M. A.*) I asked for, and he very kindly supplied, a culture, which, when washed with the limewater-bouillon-serum mixture gave a sporulating bacillus, corresponding both serologically and culturally with those which I had isolated from the eight cases used in my experiments.

Intravenous inoculation into cats produced in a small percentage of cases muscle paralysis, but in all, symptoms of distemper, and even death, with marked cerebral and spinal cord engorgement, when as much as 1 cc. of a virulent culture was employed. Similar results were obtained with rabbits. The organism was recovered in every instance from the cords and brains of the animals that come to autopsy.

The accidental installation of a drop of a fluid culture into the eye caused an abortive attack in an experimenter (myself) and the organism was recovered in scrapings from his throat, and a suspension of the same caused paralysis in a rabbit, and, when inoculated into a guinea pig, intraperitoneally, death within a week, with spinal cord congestion and cerebral engorgement and hemorrhage, the organism being recovered from the brain tissue. From contact (same cage) with the latter, two guinea pigs and a young rabbit contracted the infection and died, showing the same lesions and organism.

In a series of serum reactions (not yet published) in which the blood serum of animals, immunized to cultures (from cord tissue) from particular cases of human poliomyelitis, and blood from fifty cases of the recent epidemic were tested against particular cultures (including the one got from Dr. Rosenow and from distemper in dogs) evidence has been obtained indicating the existence of different strains of the organism and its intimate relationship to the organism of dog-distemper. The behavior of various cultures also tends to confirm this idea, although it is not yet apparent whether these differences are as fixed as in the case of the organisms of the colon-typhoid group.

An exceedingly important and illuminating characteristic of the organism is the readiness with which it grows in milk and at summer temperature (70 F.).

Further, as I have repeatedly found, cultures in milk survive the official pasteurization process (heating for a half hour at 142°-145° F.) so that this method would be no protection whatever to consumers against milk infected with the bacillus. In fact the killing off of other contaminants would favor an extensive growth of the poliomyelitis germ in milk kept at summer temperature.

I recently looked up the literature of the epidemiology of poliomyelitis bearing upon the incidence of the malady among infants and was struck by the almost entire absence of cases from among the exclusively breast fed. The epidemics studied comprised some 60,000 cases, and, when gathered from all the reports, the cases stated to have been among the exclusively breast fed were under 300. In the reports of various epidemics in Massachusetts the statement is made that there were *"no cases among the exclusively breast fed."*

I know of no data bearing on the incidence of the malady among exclusively breast fed infants in our recent epidemic but, since it is said that less than 11% of the cases were under one

* Medical Record, January 13, 1917.

year of age, it is evident that, at least, there were comparatively very few.

It is, of course, undeniable, from the nature of the infection, that contact cases may develop, and the percentage of the same may be indicated by the incidence of the disease among the exclusively breast fed exposed to other cases, since milk infection, except in the case of an infected mother, would be excluded. Furthermore, if the organism causing distemper (often with paralytic symptoms) among the domestic animals, coincidently with outbreaks of human poliomyelitis, so frequently mentioned in the literature, be actually identical with its certainly near relative, that causing infantile paralysis, then the per cent. of contact infection from animals to man will approximate the rate from man to man. However, the great mass of the evidence in the literature indicates that direct human to human transmission is of small importance.

It may be, in the development of the disease in even the most susceptible child, that massive doses of the organism are necessary, as, for instance, in large quantities of milk, either surcharged with the germs, or in which great multiplication of the organism occurs after ingestion.* The paresis of the intestines common at the onset of the malady, helps this theory, since the longer the infected material lay in the intestines the greater the number of germs that would gain access to the system.

In connection with the temperature at which I found the organism grew well, note the temperature range in New York City during the recent epidemic, and how the case incidence rose and fell as the mean of 70° was passed and repassed.

Month	Mean Temperature	Cases
May	59.3° F.	29
June	64.2°	756
July	73.8°	3863
August	73.6°	3306
September	66.0°	780
October	57.2°	193

* A most interesting "Report of a Possibly Milk-Borne Epidemic of Infantile Paralysis" by Dr. John C. Dingman, of Spring Valley, N. Y., appeared in the December number of the *New York State Journal of Medicine*.

NAIL PUNCTURE WOUNDS OF THE FOOT: RESULTS IN 100 CASES.

By W. Irving Clark, M.D., F.A.C.S.,
Worcester, Mass.

This paper represents work done at Norton Company Hospital during the year 1916. In all cases the technic was the same, though the treatment was administered by different doctors and nurses. The work having been done upon employees covered by insurance, it has been possible to get accurate data upon the exact duration of disability for work from the insurance company, while the hospital records give the number of dressings needed by each patient.

Nail puncture wound of the foot is a common surgical condition occurring among laborers, especially those doing construction work. The puncture wound usually occurs through a man stepping on a plank from which there are projecting nails. These naturally vary in length, but usually project from 1 inch to 1½ inches beyond the plank. In the majority of cases the nails are clean and sharp, and make a stab wound which penetrates the sole of the shoe, the sock and the foot. In every case the patient had removed the nail from the foot himself before applying to the Hospital for treatment. The majority of wounds occur upon the ball of the foot (62%), and there seems to be little choice as to which foot suffers. We find that they are about equally divided between the right and the left. Most of the injuries appear to be near the center of the ball, between the first and fourth toes. The nail, upon entering the foot, passes through the tough outer skin, penetrates the deep fascia, and then passes through the muscles and embeds itself between the metatarsals. The tendency seems to be for the metatarsals it strikes to slide away from the nail. In my whole series of 100 cases there was not one in which there was any evidence of a nail having penetrated the tendon sheath of the flexor tendon, or of injury to the tendon. It is generally believed that wounds of this type are very prone to become infected, because of the dirty shoe, the equally dirty sock and the still more filthy condition of the patient's foot. If not treated, these cases certainly become septic in many instances, as I have found from my general hospital experience. The same is true in a few cases here noted which presented themselves for treatment after an interval of a day or more following the accident. The majority of cases, however, were treated immediately following the accident, that is, within a period of fifteen or twenty minutes, and I attribute the good results to this proper treatment.

The method of treatment used is that recommended by Dr. W. G. Hudson of the DuPont Powder Company, in a personal conversation, and this method is at present in use at the DuPont Powder Company as well as Norton Company. The technic is as follows: The foot is thoroughly washed with hot water and soap, in order to get it as clean as possible. This is done rapidly and thoroughly, very hot water being used. The foot is then dried, and an area about 2 inches square around the puncture wound is thoroughly washed with alcohol. The sole of the foot is then painted over with commercial gasolene, and after this has evaporated one or two coats of tincture of iodine are applied in and around the wound. A sterile probe is then passed into the wound without pressure, and finds its way to the full depth of the wound. It is important that this manipulation be done

gently, and that the end of the probe be guided in several directions after passing through the skin, as the plantar fascia is liable to be distorted following the accident, so that at first the wound appears to be more superficial than it is, and the deeper hole must be found before the full length of the tract of the injury can be probed. After the probe fills the entire wound tract a hypodermic is filled with 10 cc. of tincture of iodine, U. S. P., and the needle is gently inserted following the probe as a guide, and hugging it closely until it has reached the bottom of the wound. The iodine is then injected very slowly and allowed to run out along the probe until the operator feels certain that the entire tract has been thoroughly washed out with iodine. The probe and needle are then withdrawn. (This injection of iodine is very painful, but the pain is of the bearable type and feels like a sharp burn. It lasts only from 30 to 45 seconds as timed by watch). A dry sterile gauze dressing is then applied. If the puncture wound is very deep the man is instructed not to work for the remainder of the day, but many cases have returned to work at once. We usually advise patients to return in twenty-four hours for observation, even though they are having no trouble. When there is pain it is almost invariably near the dorsal surface of the foot between the bases of the toes over the point of the terminus of the puncture wound. This tenderness and pain seldom lasts more than 48 hours, and is usually not sufficient to keep the man from work.

The following statistics may be of interest:

Total number of cases	100

FOOT INJURED.

Right	50
Left	47
No report	3
	100

PART OF FOOT AFFECTED.

Sole	37
Ball	5
Ball base of little toe	14
Ball base of great toe	15
Ball base of fourth toe	1
Ball base of middle toe	24
Ball base of second toe	3
Arch of foot	1
	100

Total number of dressings	194
Average number of dressings per case	1.94

	DAYS
Total time lost	29
Average time lost	0.29
Longest time lost	7

TIME LOST FROM WORK.

	DAYS
2 cases	1
2 cases	2
1 case	3
2 cases	4
1 case	5
1 case	7

In three cases of my series infection was present at the time the patient came to the Hospital, due to the wound having been received twenty-four hours or more previous to the patient's reporting to the Hospital. In each case the wound was slightly opened, and the same method of treatment given as in the clean cases. The results were as follows:

	DRESSINGS
1 case	1
1 case	2
1 case	3

No time lost from work.

The infection in these cases was very slight, consisting only of redness and one or two drops of pus exuding from the wound. In no case of the hundred here reported, or other cases which I have observed, has tetanus appeared, even in cases treated at the general hospital, where sepsis has been marked.

CONCLUSIONS.

1. Nail puncture wounds of the sole of the foot are not dangerous and seldom cause infection if promptly treated, when caused by clean nails projecting from a board, as occurring in the building trade and general construction.
2. This type of wound does not produce tetanus, except possibly in very rare instances.
3. A simple and effective method of sterilization of puncture wound may be obtained by injecting the wound with pure tincture of iodine.
4. These injuries, contrary to general belief, produce very little disability and require few dressings.
5. Prompt treatment is essential in order to get the best results.

Book Review.

Encyclopedia Medica. Second Edition. Under the general Editorship of J. W. BALLANTYNE, M.D., C.M., F.R.C.P.E. Vol. IV. Edinburgh and London: W. Green & Son. 1916.

This fourth volume of the English edition of Ballantyne's medical encyclopedia contains the topics from ear to filariasis inclusive. The separate articles are the work of distinguished British physicians in addition to the editor. The chapter on ptosis is by the late Dr. A. Lockhart Gillespie, that on eugenics by Dr. C. W. Saleeby and that on favus by Dr. Norman Walker. The work is abundantly illustrated with full-page plates and many text cuts. The section on embryology by Dr. Ballantyne is particularly to be commended. Many of the articles are revised and rewritten. The sections on eclampsia, otosclerosis and eugenics are new. This volume continues the value of its series as a permanent encyclopedic record of medical knowledge.

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THE ACTUALITY OF WAR.

ON April 5 the Senate, and on April 6 the House of Representatives of the United States, by an overwhelming, though in neither instance unanimous vote, passed an official resolution declaring that a state of war exists between our country and Germany. All differences of opinion which previously existed about questions involved in this momentous action are now obliterated. Henceforth the whole duty of every citizen of the United States is to do his best share in the vigorous and efficient prosecution of this war to a successful conclusion. The determination, in each individual instance, what that most serviceable share shall be, may often present problems difficult of solution. For every physician, as well as for every other citizen, whatever his capacity, special training or opportunity may be, the sole guide in the solution of those problems should be loyalty of devotion to his country and to his profession.

A MEDICAL PROFESSION THAT IS STATISTICALLY STATIONARY.

SOME very interesting statistics on the medical profession of the United States are contained in the report of the Committee on Social Insurance of the Council on Health and Public Instruction of the American Medical Association recently published. From a canvass of the United States Census of 1910 it appears that this country has approximately one physician to every 600 of the population and that this proportion has remained the same for the past sixty years. Furthermore, the rate of growth of the medical profession has been rapidly declining, the number of medical graduates not much exceeding the loss by death and the abandonment of this profession for other pursuits. In the forty years from 1870 to 1910, teachers of music increased at the rate of 770; other teachers, 396; clergymen, 205; lawyers, 200; dentists, 410, and physicians, 153, while the population increased by 138 per cent. Thus the medical profession was the only profession of those enumerated that failed to increase substantially in proportion to the population. Although there has been an increase in the ratio of medical men to the population on the Pacific Slope, it has remained stationary in the Middle West and throughout the South it has declined, especially in the rural and semi-rural communities, so that in South Carolina, at the present time, the proportion is 1 to 1,176. This, however, is greater than the lowest of any of the nations of Europe that are tabulated, namely, Italy where the ratio is 1 to 1,484. On the Continent the ratios rise through 1 to 1,537 in England and Wales; 1 to 1,969 in France; 1 to 2,124 in the German Empire, reaching 1 to 7,865 in Russia.

Medicine is now a profession of the mature male married native-born population, according to these statistics. Approximately 40% of the practising physicians are over 45 years of age and some 25% are from 35 to 44 years old, and the percentage of single men is much smaller than in other professions and has declined in the last ten years. As one would expect, the large cities show a greater proportion of physicians to the population than do the smaller cities and the rural districts. Boston, for instance, with a population of 670,589 has one physician to every 357 citizens, while Chicopee, Massachusetts, with 25,401 inhabitants has one physician to every 1,115; the ratio for the state being 1 to 541.

Whether the gradually decreasing proportion of

physicians means inability of the masses to support more doctors, or stricter requirements for medical education, both on the part of the medical schools and the public, is not altogether plain. It may be interpreted fairly, however, as an indication that we are approximating the conditions in the older civilizations, that the era of hit-or-miss-it practice is passing and that the people are being served by a better trained, more mature medical profession.

THE MODERN TENDENCY TOWARD WEAK-FOOT.

WITH the evolution of the human species—its rise from a four-footed to a two-legged animal—the importance of the lower limbs, the feet especially, in locomotion, but particularly in maintaining equilibrium, has risen quite beyond ordinary conception. Indeed, present day civilization has brought in its train a condition of foot-atrophy from disuse. The elevator and the automobile, as the favorite means of movement, have left feet undeveloped and almost unnecessary. But the bane of this failure of foot development becomes visible when for any reason the feet must be conscripted, so to say, into use, as in military life with its marches, in athletics, or even certain industrial pursuits. Even without these calls, the increasing tendency to weak-foot is rendered obvious through the greater and greater demands for orthopedic aids to walking. Usually, however, these orthopedic aids in the incipient stages of weak-foot may do a great deal of harm. They still further rob the muscles of their rightful function of support; there is atrophy from disuse and then more artificial support—a sort of vicious circle. The indiscriminate use of artificial supports, usually arched quite beyond the normal and purposed for a sort of pseudo-overcorrection, is to be discouraged whenever possible. No arch support is properly applied unless patterned after a cast of the foot, so that it supports the arch as it is, while other medical or mechanical means are used to strengthen the muscles and to replace the arch.

Primarily flat-foot or weak-foot is weakness in the plantar flexors and invertors. This is very often congenital but usually acquired. It must continually be borne in mind that besides the main arch there is also a minor arch extending between the first and fifth toes. For the relief of weakness in either arch, proper foot exercise to strengthen the offending muscles is most important. But it is imperative that weak-foot be diagnosed early. Pains in the calves of the legs radiating to the knee and even to the spine are the result of failure to keep the weight of the body on the arches. Unfortunately, these pains are very often diagnosed as "rheumatism." Quite remarkably, however, and unlike rheumatism, these pains disappear on lying down only to reappear on rising. Strong pedal muscles make strong arches. Exercises to develop these muscles will probably do more to re-establish the integrity of the arches in the early stages, and as a preventive measure, than even drastic orthopedic measures in the later stages.

Bad walking habits are other factors in the development of weak-foot. The normal foot should be straight—turned neither to the right nor to the left. The aboriginal foot and the young child's foot are straight. The normal foot is in a straight line from great toe to heel and maintained perpendicular to the mid line of the body. As much attention must be paid toward maintaining the feet in proper position as to the general carriage—but they probably go together anyway. The military requirement of keeping toes out and heels together was undoubtedly a great factor in weakening the arch and even in destroying it. For those with bad walking habits and weak feet, carrying the toes somewhat more inward is of good effect as tending to overcorrect.

Likewise, bad fitting shoes constitute a very great factor in the modern weak-foot. Shoes that do not conform to the normal shape of the foot injure it. The shoe must be built on the lines of the normal foot—straight line from great toe to heel.

Only a timely and vigorous campaign of education in the matter of proper footwear, foot habits, and foot exercises such as marches, hikes and systematic foot calisthenics can save us from becoming creatures who are neither four footed nor yet two footed, and certainly not sure footed.

THERMOMETER DISINFECTION.

PROBABLY no instrument in the armamentarium of the physician has so much constant use as the thermometer; no instrument that is so often in contact with infectious membranes of the body; and, needless to say, no instrument whose importance as a diagnostic aid is greater. Yet this instrument often receives the least amount of attention with respect to its cleansing and dis-

infection before use. When the now almost obsolete method of applying the clinical thermometer between folds of the skin, in the axilla, groin, etc., was very much in use, perhaps the danger of carrying infection from the unbroken skin was too slight to require extraordinary care. But with the use of the clinical thermometer in the buccal and preferably in the rectal cavities, which are recesses for much infection, it is surprising that the carrying of disease through the careless use of the thermometer is not more often reported, as it is more than a mere possibility. The theory of "air borne" infection is no longer tenable. Infection is spread by direct contact—discharges of patient with the sensitive mucous membranes of new victim. If carried through the air at all it is carried by the so called "droplet infection" method in which the infective material is propelled through the air from one to another through coughing, sneezing, careless and boisterous talking. The careless use of the clinical thermometer obviates any difficulties that may be in the way of infective discharge reaching another person. The thermometer acts as a direct carrier. The sticky secretions that adhere to the thermometer are not easily removed by the usual simple immersion in water for a short time nor by holding it under cold running water for the same period. The pernicious habit of using one and the same thermometer for rectal as well as buccal application is fortunately not very common. It would seem to be barred from aesthetic, if for no other reasons. At any rate the disinfection of the clinical thermometer must receive the same consideration as other instruments used within the body. Of course, heat cannot very well be applied, but proper mechanical cleansing can—and when followed by some appropriate antiseptic solution in contact for an indicated time is as ideal a method of disinfection as can be expected under the circumstances. Much the safer plan would be for the physician to carry with him on each round a sufficient number of thermometers to use in rotation, the same one not again to be used until properly cleansed and sterilized. It goes without saying that in so far as thermometry is concerned every patient should have his own thermometer—but that, unfortunately, is not always possible to enforce except in protracted illnesses.

To emphasize the need of individual and properly sterilized clinical thermometers, B. E. Holsendorf, United States Public Health Service (Public Health Reports, March 16, 1917), has devised for use at quarantine stations a convenient portable container for a large number of sterilized thermometers. The examination of passengers and crews under quarantine requires the use of thermometers on a large scale. No thermometer can very well be used on more than one person without proper treatment; and unless this treatment is afforded to a large number of thermometers before actual inspection, their treatment at inspection would cause a great deal of delay. Besides, it could not be done so well during the haste of inspection as during the leisure of preparation. Holsendorf's container is made to accommodate 40 thermometers. The disinfectant solution he uses is formalin. Just before use the rack and its load of thermometers are taken out of the formalin solution, rinsed in clean water and allowed to dry.

The moral of this device demonstrates the necessity of disinfecting the thermometers after use even by apparently normal individuals—let alone those to whom the physician is called to minister because of disease. For the physician practicing among the lower strata of society where the amount of infections seems to be larger and the possibility of carrying them great, this one element in the spread of infection could perhaps be best eliminated by the use of a device such as suggested by Holsendorf but on a scale commensurate with the circumstances.

REGISTRATION OF PHYSICIANS.

WHEN the original registration certificate of a physician in this State is lost, destroyed, or otherwise unavailable, a certified statement of its award should be obtained from the Board of Registration. This will be accepted by city or town clerks in compliance with the new law noted editorially in the JOURNAL of April 5.

MEDICAL NOTES.

NEW TUBERCULOSIS JOURNAL.—The publication of a monthly technical journal devoted exclusively to tuberculosis, the only one of its kind in English, is announced by the National Association for the Study and Prevention of Tuberculosis. The editorial policy of the new journal will be determined by a staff of seven experts appointed by the board of directors of the Association, consisting of Dr. Edward R. Baldwin, Saranac Lake, Editor-in-Chief; Dr. Lawrason Brown, Saranac Lake; Dr. H. R. M. Landis, Philadelphia; Dr. Paul Lewis, Philadelphia; Dr. M. J. Rosenau, Boston; Dr. Henry Sewall, Denver; Dr. B. S. Veeder, St. Louis.

Dr. Allen K. Krause, of Baltimore, the managing editor, is widely known as a worker in the research field of tuberculosis. He recently left Saranac Lake to take charge of the new division of tuberculosis in Johns Hopkins University.

The American Review of Tuberculosis, as the new publication is called, is the first technical journal on tuberculosis in this country. The intention of the National Association is to make it compare favorably with similar foreign journals.

THE AMERICAN ASSOCIATION OF IMMUNOLOGISTS.—The fourth annual meeting of the American Association of Immunologists was held on April 6 and 7 in the Academy of Medicine, New York City. An elaborate program had been prepared, consisting of twenty-seven numbers. The presidential address was given by Dr. Richard Weil on "The Relations Between Antigen and Antibody in the Living Organism." At the same time and place was held the annual meeting of the American Association of Pathologists and Bacteriologists. Programs may be obtained by application to the Secretary, Dr. H. C. Ernst, 240 Longwood Avenue, Boston, Mass. After the opening session on Friday morning, April 6, the Association adjourned to the Rockefeller Institute, where a special program had been arranged. It consisted of eight papers, including one by Dr. Flexner on "Defensive Mechanisms in Poliomyelitis," and one by Dr. Noguchi on "The Spirocheta of Infectious Jaundice."

LOOMIS SANATORIUM.—The recently published twentieth annual report of the Loomis Sanatorium, New York, for the treatment of tuberculosis, contains an interesting statement of a statistical study of all former patients of the Institution. A follow-up plan was begun and inquiries sent to former patients who were discharged up to October 31, 1915, a total of 1421 patients. Returns were received in 1229 cases, or 86.48%. Of the 1229 returns, 1108, or 90.16%, were reported alive; 90, or 7.32%, were reported dead; and 2.52% could not be found. Of the 1108 patients reported alive, 939, or 84.75%, are in a satisfactory physical condition; 145, or 13.09%, are in an unsatisfactory physical condition and 24, or 2.16%, could not be definitely ascertained.

NATIONAL ORGANIZATION FOR PUBLIC HEALTH NURSING.—The Fifth Annual Meeting of the National Organization for Public Health Nursing will be held in Philadelphia from April 26 to May 2. At this time will be held a joint convention by the American Nurses' Association, the National League of Nursing Education and the National Organization for Public Health Nursing. An interesting program has been arranged to cover the five days' meeting.

DEATH OF PROFESSOR VON BEHRING.—The death of Professor Emil von Behring, discoverer of diphtheria antitoxin, has been reported. In April, 1913, the discovery of a method of prolonged immunization against diphtheria, consisting of an injection of a mixture of diphtheria toxine and anti-toxine was announced by Professor von Behring at the congress of internal medicine in session at Wiesbaden. Tests made by Professor von Behring of the new method in the clinics of Magdeburg and Marburg had shown that the treatment was harmless and effective. Professor von Behring offered to supply clinics with the new prophylactic under proper guarantees of observation and registration.

VACCINATION AGAINST ANTHRAX.—A vaccine which will secure immunity in animals to anthrax has been perfected by the United States Department of Agriculture.

"The preventive vaccine recommended by the department is a development of the method devised about twenty-five years ago by Pasteur. Since then scientists have removed many of the objections to Pasteur's vaccine, and the new method is less dangerous to the animals treated and surer in its operation. The department now gives detailed directions for the administration of this treatment. It consists in ordinary cases of an injection on one side of the animal of ten cubic centimeters of anti-anthrax serum, followed immediately by a similar injection on the other side of the body of one cubic centimeter of spore vaccine.

"Stock owners are warned to obtain the serum and vaccine from reliable manufacturers only, and not to administer the treatment, unless the disease has appeared in the vicinity or the pastures on which the animals are turned out are known to be infected. Careless handling of the vaccine may result in spreading instead of controlling the disease. The principle underlying this treatment is the same as that which in man has resulted in the minimizing of death from smallpox, typhoid and other diseases. It consists in conferring upon men or animals an artificial immunity to the infection to which they are susceptible."

WAR NOTES.

FORSYTH DENTAL INFIRMARY OFFERS SERVICES.—The trustees of the Forsyth Dental Infirmary have offered its facilities to the committee having in charge work on soldiers' teeth. Dentists who are asked to volunteer their services will not need to provide instruments. The clinic room of 65 chairs and the entire equipment of the infirmary has been placed at the disposal of the committee for Saturdays and Sundays and for each evening beginning at 5 o'clock.

PREPARATION OF NEW YORK ORGANIZATIONS.—The State Charities Aid Association of New York has offered its services to the nation "in such form as may be considered advisable and most efficient." The New York Southern Women's Patriotic Committee with a membership of five hundred stated at a recent meeting that it favored universal service for women in "treating the wounded, cheering the sorrowful and assisting the country in any way possible should it become involved in war." Representatives of the Life Extension Institute have gone to Washington to offer the services of that organization to the government. The New York chapter of the Red Cross has announced itself ready to respond to all applications for aid from dependent families and relatives of national guardsmen who have been called into service again.

GERMAN HOSPITAL OF NEWARK, N. J.—The German Hospital Association of Newark, N. J., has tendered the government without reservation the use of its hospital, one of the largest in the city, with its staff of nurses and doctors.

LYNN HOSPITALS PREPARED.—The Lynn committee on public safety announces that the Lynn and Union hospitals have nearly completed the work of accumulating supplies and that each is now prepared to accommodate 150 patients.

RED CROSS FUND.—The Boston Metropolitan Chapter, American Red Cross, reports that it has raised $52,373.10 of the sum desired to carry on its work. The assembling of supplies has kept pace with the receipts of funds and the completed equipment of linen, bandages and hospital garments will shortly be turned over to the Red Cross Military Supply Depot No. 1.

WAR RELIEF FUNDS.—On April 7 the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund	$806,511.33
French Wounded Fund	213,558.84
Armenian Fund	169,694.13
French Orphanage Fund	91,651.61
Surgical Dressings Fund	80,519.47
Polish Fund	67,532.72
LaFayette Fund	25,967.03
French Phthisis Fund	13,536.04
Friends' Fund	11,239.77
Russian Ambulance Fund	5,770.00

BOSTON AND MASSACHUSETTS.

WEEK'S DEATH RATE IN BOSTON.—During the week ending March 31, 1917, the number of deaths reported was 277 against 245 for the same period last year, with a rate of 17.86 against 16.80 last year. There were 44 deaths under one year of age, against 35 last year, and 78 deaths over 60 years of age against 71 last year.

The number of cases of principal reportable diseases were: Diphtheria 82; scarlet fever 56; measles 172; whooping cough 9; typhoid fever 2; tuberculosis 63.

Included in the above were the following cases of non-residents: diphtheria 14; scarlet fever 22; measles 5; typhoid fever 2; tuberculosis 5.

Total deaths from these diseases were: diphtheria 1, scarlet fever 3; measles 1; whooping cough 1; tuberculosis 31.

Included in the above were the following deaths of non-residents: scarlet fever 1; tuberculosis 5.

DIPHTHERIA AT LONG WHARF.—The physicians of the United States Public Health Service state that the epidemic of diphtheria which threatened the immigrants detained at the station at Long Wharf, Boston, is under control. More than 225 cultures have been examined and found to be negative. Officials of the station are considerably alarmed over the recent frequent outbreak of diphtheria at the detention quarters and express much apprehension over ability to combat with a serious epidemic in the unsanitary quarters should it get out of control.

NURSES' CLUB HOUSE.—The Massachusetts Nurses' Club is starting a fund to build a clubhouse costing $400,000, and providing accommodations for three hundred nurses. Rapid increases in the number of nurses in the Metropolitan District and the difficulties of their securing suitable accommodation when not on a case, served to bring about the plans for such an establishment. The entire enterprise will be conducted by women nurses and will be solely for the benefit of nurses. The following are on the committee of arrangements:

Mary M. Riddle, R. N., chairman, superintendent of nurses in the Newton Hospital; Emma M. Nichols, R. N., treasurer, superintendent of nurses at the Boston City Hospital; Adelaide E. Turner, R.N., secretary, registrar of the Central Directory for Nurses; Sara E. Parsons, R.N., superintendent of nurses at the Massachusetts General Hospital; Alice H. Flash, R.N., superintendent of nurses, Massachusetts Homeopathic Hospital, and Carry M. Hall, R.N., superintendent of nurses at the Peter Bent Brigham Hospital. The club has 600 members and is just starting on its sixth year.

The building planned is a six-story, fireproof structure with restaurant, cafeteria, offices, and shops on the street floor. There will be a hall seating 1500 persons. It is expected that the clubhouse will not only become self-supporting, but pay a reasonable rate to its financial supporters.

LECTURE SERVICE OF THE STATE DEPARTMENT OF HEALTH. The State Department of Health of Massachusetts reports that during the year ending November 30, 1916, twenty-three persons connected with the department gave 628 lectures in 183 towns, the total attendance aggregating approximately 100,000. These lectures, in many instances, were illustrated with lantern slides relating to various health subjects. The Department also has several moving-picture films which are available for exhibition in connection with health weeks or health exhibits. "Bringing it Home" relates to infant welfare and the public health nurse; "The Great Truth," "The Temple of Moloch" and "The Price of Human Lives" relate to tuberculosis; "The Price of Thoughtlessness" to preventable accidents; and "Fly Danger" shows how flies breed and spread infection.

THE CHILDREN'S HOSPITAL.—The forty-eighth annual report of the Children's Hospital for the year ended Dec. 31, 1916, states that during that time it has cared for 3,388 patients in the wards, performed 2,469 operations, 1,253 being on the throat, and treated 9,283 patients in the out-patient department. The social service department has cared for 1,346 new cases. The service that the hospital is rendering in the care of infantile paralysis patients is worthy of note. In September the hospital was requested by the Commission on After-Care of Infantile Paralysis in New York City to loan its director of physical therapeutics to New York to instruct New York nurses in the muscle reëducation of these cases, which is the most important part of the modern treatment. This course was given for three months in New York. Meanwhile the nurses for the New York work were sent to Boston by the New York State Department of Health and were instructed here, partly at the Children's Hospital. In November the hospital offered a course in muscle training in the after-care of infantile paralysis which was taken by ten women from various parts of the country who came here and remained ten weeks, working while at the hospital, and the fees derived from this course have been, for the most part, utilized for the maintenance of the clinic. The out-patient treatment of infantile paralysis was found to be more efficacious if conducted apart from the regular out-patient department, and an anonymous contribution of $6000 was received for the maintenance of this clinic. The Commission on Infantile Paralysis of the Harvard Medical School, acting agent of the State Department of Health of Massachusetts, has made this department of the hospital its central clinic. It is held at the hospital three mornings a week, and at intervals of a week or so the entire personnel of the clinic is transported to some city or town in the state where patients who are not easily able to come to Boston are examined in consultation with their doctors, and treatment prescribed. The hospital, therefore, in this service has broadened its influence beyond its own community and has made important affiliations both with the Medical School and the State Department of Health. Such expansion has been a serious matter financially for the hospital, but it is an obligation which the managers have taken on in the confident hope that they will receive adequate support from the community.

BABY WEEK CAMPAIGNS.—The Federal Children's Bureau reports that plans are being made in thirty-four states and five hundred and two communities to hold a Baby Week. In most of these communities the time chosen is the first week in May. California, Massachusetts and some communities in Pennsylvania will hold Baby Week before that time. Several state committees have selected some one phase of infant welfare work for special emphasis in this year's campaign. In Washington, Illinois, Iowa, New Hampshire and Ohio the importance of complete birth records is being emphasized. The Delaware campaign is to be devoted to the prevention of infantile paralysis. North Dakota calls attention to the needs of children under school age. Kansas, which held the record among all the states for the largest number of local Baby Weeks in 1916, is emphasizing three needs in this year's plans: complete birth registration throughout the state, instruction of mothers in the principles of baby care; and better understanding of the care that expectant mothers ought to have.

Leaders in the baby campaign in Massachusetts and the Boston Federation of Women's Clubs have adopted "Babies Well and Happy" as their slogan. The campaign will be held throughout the month of April. Dr. Agnes C. Vietor will have charge of the Boston campaign and Dr. Evangeline W. Young will conduct the state campaign. The opening day will be April 2d and an all-day meeting will be held at the Boston Public Library. The following subjects will be especially emphasized; the importance of complete birth registration; pre-natal care, care of the baby, and the organization of the Massachusetts Girls' Health League.

NEW ENGLAND NOTES.

CONNECTICUT.—At the annual meeting of the New London County Medical Association held in Norwich, April 5, Dr. Paul P. Swett, orthopedic physician of Hartford, Conn., read a paper on Sciatica.

Plans are being figured for a hospital building for the Norwalk Hospital Association, in South Norwalk, which will contain 60 private rooms, wards, operating room, etc.

MAINE.—Fire destroyed the Harlow building at the State Hospital for the Insane in Augusta, March 22, but all patients were saved and cared

for in new quarters. An act appropriating $60,000 for the rebuilding is being pushed so that there will be as little delay as possible in the progress.

Dr. Eugene C. Fogg and Dr. H. P. Merrill, both of Portland, are to take the preliminary examinations that will qualify them for the rank of assistant surgeons in the United States Navy Reserve Corps.

NEW HAMPSHIRE.—The New Hampshire Chapter of the Red Cross is active in endeavoring to establish and maintain permanent headquarters in the State.

RHODE ISLAND.—An amendment to the General Laws of the Practice of Medicine has been proposed, which provides that the State Board of Health shall prepare a list of the medical schools whose graduates will be acceptable to the board, and also a statement and schedule of the subjects in which applicants are to be examined. This list and schedule are to be in force for a period of 12 months after it is placed on record. All applicants who pay their fee for examination are to be examined, and a record made of their examination and the decision of the board thereon, also in case of refusal of registration, the reason for such refusal. Such record is to be open to the inspection of the applicant examined, or his duly appointed secretary.

The executive committee of the Providence Chapter of the Red Cross is rushing its plans for the establishment of the Naval Base Hospital in that city. Of the necessary $25,000 for the purpose, $7,600 has already been promised.

VERMONT.—A bill introduced into the House of Representatives recently, designed to bar physicians coming from foreign countries from practicing in the state, was killed in that assembly. It was pointed out that a similar law is in effect in Canada.

Members of the Vermont Committee of American Physicians for Medical Preparedness, met on March 16 to discuss plans in case of national emergency. It was voted to take an inventory of all hospitals in the state to determine their facilities for caring for patients and other equipments, and to list physicians who do special work, such as surgeons, eye and ear men, etc., and to find out all those who are able and willing to serve with the Medical Reserve Corps. A committee of doctors of Franklin County are planning to organize the medical men of the county into a branch of this body.

Dr. Herbert W. Taylor, first assistant physician of the Brattleboro Retreat and assistant surgeon of the First Vermont Regiment has been summoned to duty.

Ninety-one cases of measles have been quarantined in Brattleboro, where there have also been numerous cases of chicken pox, whooping cough and mumps.

Obituary.

THOMAS BERNARD SHEA, M.D.

DR. THOMAS BERNARD SHEA, deputy health commissioner of the City of Boston, died at his home on March 25. Dr. Shea was born in 1859 and received his early education at the Brimmer School and Boston Latin School. He graduated from Holy Cross College, receiving his bachelor of arts degree in 1884, and his master of arts degree in 1887. In the same year he graduated from the Harvard Medical School. He then became assistant resident physician of Long and Rainsford islands, later becoming assistant port physician and medical inspector, and in May, 1904, was appointed to the position of health commissioner. In July, 1906, he resigned to become chief medical inspector and later deputy commissioner of health of the City of Boston, which position he held at the time of his death. He was widely known for his achievements in smallpox control, especially during the epidemic of 1902. During the past summer he was indefatigable in efforts to control the poliomyelitis epidemic in Boston.

Dr. Shea was a member of the National Association for the Relief and Control of Tuberculosis, the American Public Health Association, the Massachusetts Association of Boards of Health, the Massachusetts Medical Society, and the American Social Science Association. He is survived by one brother and one sister.

JOSEPH F. O'SHEA, M.D.

DR. JOSEPH F. O'SHEA, city physician of Lynn, Mass., died at his home on March 29. Dr. O'Shea was born in Ireland in 1863 and came to this country when very young. He studied in the Lynn public schools, in Villa Nova College, Pennsylvania, New York Medical College, Columbia University, Bellevue Medical College and in Berlin.

After he had completed his studies he returned to Lynn, and in 1886 served as house officer in the Lynn Hospital. The next year he was appointed a member of the staff and retained that connection up to the time of his death.

For the past seven years he had been city physician and associate medical examiner. Dr. O'Shea was a member of the Massachusetts Medical Society and was at one time president of the Essex District Medical Society.

He was greatly beloved by patients and friends and admired for his efficient and pains-

taking discharge of his official duties. His skill as a practitioner made him well and favorably known among all who came in contact with him and his winning personality endeared him to the hearts of hundreds of patients and friends.

WARREN WILBUR PILLSBURY, M.D.

DR. WARREN WILBUR PILLSBURY of Newburyport, died there April 1, 1917, after a long illness, aged 69 years. He was a native of Manchester, N. H., and was graduated from the Medical School of Maine in 1873 and settled in Newburyport the following year, at that time joining the Massachusetts Medical Society. He was vice-president of the Essex North District Medical Society in 1908-1909, and president in 1910-1911. He was a member of the staff of the Anna Jacques Hospital and served on the school board. A widow and three daughters survive him.

Miscellany.

NEW YORK ASSOCIATION FOR IMPROVING THE CONDITION OF THE POOR.

THE Bureau of Welfare of School Children has recently issued the following memorandum in support of the 1917 budget estimates of the Department of Health for health supervision of school children.

The 1917 budget estimate of the Bureau of Child Hygiene of the Health Department calls for $75,240 more than last year for school health work. The additional money is needed for enlarging the staff of medical inspectors and nurses so as to reduce the present proportion in the number of children to physician and nurse to a better working basis. Six dental hygienists are also asked for, who are to be engaged in prophylactic work and giving surface treatment, thereby adding considerably to the preventive as well as curative services at present available in the schools and clinics. The following table shows the present and proposed staffs:

	1916	1917	INCREASE
Medical Inspectors	100	125	25
School Nurses	200	252	52
Dental Hygienists		6	6

HEALTH CONDITIONS AMONG SCHOOL CHILDREN ARE TOO SERIOUS TO BE NEGLECTED.

The 1915 reports on medical inspection show that out of over 925,000 pupils enrolled in the public and parochial schools, only 305,665, or 33%, were examined for physical defects, leaving a large percentage among the two-thirds of the enrolled children not examined possibly suffering from various physical defects, which in their very nature are a handicap to school progress. Of the children examined, 222,072, or 72.6%, had physical defects requiring treatment as follows: defective vision, 14.5%; defective nasal breathing, 9.5%; hypertrophied tonsils, 11.2%; defective nutrition, 5.3%; defective teeth, 63.9%; and to a lesser extent there were cases of cardiac and pulmonary diseases, defective hearing and orthopedic defects.

The large number to be examined and the small staff of physicians available made it impossible at times to give each child a complete physical examination, with the result that 129,125, or 42.2%, of the children examined did not have their vision tested.

The large percentage of undetermined cases under treatment or investigation proves the insufficiency of the staff employed for this vast and important task. As much of the curative work done by private physicians or at clinics is due largely to the follow-up efforts of the school nurses, this phase of the health supervision cannot be conducted as effectively as desired unless an adequate staff of nurses is provided.

Both these handicaps in the results of the year's work are due to the large number of pupils assigned to each physician and nurse, being respectively 9200 and 4800, whereas the ratio should never exceed 3000 in either case. The appointment of the additional physicians and nurses asked for will reduce but slightly this ratio.

RATIO OF PUPILS TO PHYSICIANS AND NURSES.

	1916	1917
Pupils to physician..	9,200	7,400
Pupils to nurse	4,800	3,666

Public safety demands the quick recognition and exclusion from school of all cases of infectious disease. The health and efficiency of each individual child demand the discovery of any physical defects which may have a deleterious effect, not only on his well-being, but also on his educational progress. Without the proper number of physicians and nurses indicated above, neither of these important requisites can be observed. The welfare of the community as well as the interests of our educational and health systems are sufficient grounds on which to urge the granting of the increased appropriation asked by the Health Department.

MORE MEDICAL INSPECTORS NEEDED.

Under the Education Law of the State of New York, the employment of physicians to examine each public school child *each year* is made mandatory outside of New York City. Under the present system in New York City each child is examined but *once in three years* during its school life. The cities of Boston and Philadelphia, where social and economic conditions affecting school children are analogous to those

in New York, are governed by the laws of the states of Massachusetts and Pennsylvania, respectively, which make annual examinations of school children mandatory. Similar statutory provisions are in force in the states of Maine, Minnesota, North Dakota, Rhode Island, Utah and West Virginia. If we cannot insure the annual examination of each child attending school in New York City and the effective following-up of each case found needing medical attention, the city should at least provide for the thorough examination and following-up of a larger percentage of children than it is at present possible to reach.

ADDITIONAL NURSES NECESSARY.

The school nurse plays a highly important part in our school health supervision. Her duties are many and extend beyond the school building. The efforts of the medical inspectors would be of little avail without the following-up of the cases by the nurses. Upon the school nurse devolves the highly important duty of examining the children for contagious diseases. This work consumes a great part of the nurse's time, and is in its very nature a very exacting procedure. Adding to this the follow-up work with its many home visits, taking children to dispensaries for treatment, and the numerous cases requiring emergency treatment which turn up daily in every school, it will readily be seen that the present staff of nurses is insufficient and that the individual nurse is overtaxed.

The number of children cured of serious physical defects thus depends largely on the number of parents receiving the advice and aid of the school nurse. This activity is necessarily limited by reason of the small number of nurses assigned to this work, with the result that large numbers of cases are never reached, often with very serious consequences.

DENTAL HYGIENISTS FOR PREVENTIVE WORK.

For the first time in the existence of the system of medical inspection in New York City, funds are requested for the employment of dental hygienists. The experience of Bridgeport, Connecticut, and other cities employing dental hygienists has demonstrated the great value of their services, as well as the considerable economy effected thereby. Instruction in the care of the teeth, which at present is an added burden to the many other duties of the school nurses, and the cleaning of children's teeth, which is seldom done in the clinics, can be done expeditiously and satisfactorily by dental hygienists, especially trained in these branches of dental practice. The large percentage (63.9%) of children with defective teeth in the public schools, and also the fact that more than half of these children are probably too poor to patronize private dentists, offer the most convincing proofs of the need for such prophylactic treatment being made easily and continuously available to the children in our schools.

Correspondence.

LETTER FROM CHAIRMAN OF MASSACHUSETTS HEALTH INSURANCE COMMITTEE TO PRESIDENT OF THE MASSACHUSETTS MEDICAL SOCIETY.

March 25, 1917.

Dear Dr. Woodward:

I am writing to you with the desire to promote cooperation and to correct what I think must be a very definite misunderstanding in regard to the Committee on Health Insurance, of which I am chairman. In the first place, in order that the purpose of this committee, and particularly the position of those who, at my invitation, have become members of it, may not be misinterpreted, I wish to make it quite clear that I myself accepted the chairmanship of the committee on the express stipulation that it did not involve supporting the Young bill or any other particular piece of legislation that might come up, as, while I am in favor of the general principle of health insurance, I have felt and still feel that it is undesirable that legislation in favor of it be enacted this year at any rate. I myself wrote all the letters inviting people to join the committee, and I think it is due to them to say that a very considerable proportion of them accepted membership on account of my very clear statement in the letter that the members were entirely free to oppose, take no action on, or to support, individually, any legislation now or in future, but that the committee as such would not, without general consent of its members, at any time support any particular legislation, and would not this year support as a body the bill before the Legislature, though some members of the committee would do so. I have, therefore, some responsibility toward the members of the committee, especially toward those who seemed at the meeting of the full committee to be in the majority, and who did not favor the passage of the Young bill, and I am writing you partly because I understand that it is believed by many persons, and particularly by some of the members of the committee of the Medical Society that my committee is advocating immediate legislation. It is definitely not doing this as a body, though some of its members are. The committee, on the contrary, is established for the purpose of studying the question and attempting to influence wisely, if it can, the legislation that a large proportion of the committee consider is exceedingly likely to come very soon and that we hope will, if carried out, be done in the light of more knowledge than we now possess regarding certain matters of much importance relating to it. We have at present, and anticipate that we shall have throughout the coming year, a paid secretary giving a large part of his time to investigative work. He is at present working on such questions as the probable cost of health insurance to the State, the employer and the employee, the financial bearing it is likely to have upon physicians and upon established medical charities, the amount of sickness there is in the State that would come under such a system, so far as this can be approximated, the cost to the State, to municipalities, and to private charity of the present methods of caring for sickness, and how far health insurance would relieve this cost, and some similar questions.

I have hoped that, since there is a great deal to be done to get the information necessary to answer these questions with some accuracy (and all such information is very desirable for wise action for or against the principle if the general interests of the public are to be safeguarded before future Legislatures), my committee might work in very friendly and cordial coöperation with the committee of the Massachusetts Medical Society. Of course we have, on the whole, a more favorable attitude toward

the principle than some of the members of your committee who are very much opposed to it, but, nevertheless, we are all after facts, and we certainly, neither of us, deire to distort them, and I hope that we can work together and, so far as possible, share each other's facts in order that we may both work toward the enlightenment of each other and the public at large.

With very kind regards, I am,

Faithfully yours,

DAVID L. EDSALL.

80 Marlborough Street, Boston.

INFANTILE PARALYSIS IN 1917.

North Abington, Mass., April 7, 1917.

Mr. Editor:

In the issue of the BOSTON MEDICAL AND SURGICAL JOURNAL of March 29, 1917, under Medical Notes, I read, "Infantile Paralysis in Whitman," and it says that it is the first case appearing in the Old Colony District this winter. I had a case of infantile paralysis which occurred on Jan. 7, 1917, and was sent to the Brookline Contagious Hospital the next day, where she died on Jan. 9.

Respectfully yours,

RICHARD B. RAND, M.D.

MARRIAGES.

DR. MERRITT LA COUNT JONES, of Wausau, Wis., a graduate from Harvard Medical School, Class of 1915, was married on March 24, to Miss Grace Hayward Ivers, of Cambridge.

APPOINTMENTS.

DR. GEORGE W. GALE has been reappointed medical examiner in Saugus.

DR. E. R. MARSHALL, of Providence, R. I., formerly in charge of the local office of the Federal Health Service in that city, has received an appointment at Ellis Island, N. Y. He is succeeded by Dr. Dana E. Robertson.

DR. GEORGE W. GOODE of Brookline has been appointed visiting physician to the Out-Patient Department of the Middlesex Hospital in Cambridge.

DR. TIMOTHY LEARY has been reappointed Medical Examiner for Suffolk County.

DR. JOHN FRANCIS CREMENS, of Cambridge, has been appointed assistant surgeon in the navy, with the rank of lieutenant. Dr. Cremens graduated from Georgetown University in 1915.

DR. J. J. GOODWIN of Clinton has been made first lieutenant in the medical corps of the United States Army.

DR. H. D. HANDY of Harwich has received a reappointment as medical examiner for Barnstable County, first district.

DR. P. A. GRADY has been appointed town physician of Clinton, Mass.

DR. WILLIAM E. CURTIN of North Plymouth has been appointed as medical inspector of Company D, Fifth Regiment, M. N. G.

DR. DAVID D. BROUGH has been appointed deputy health commissioner, to take the place of Dr. Thomas B. Shea, recently deceased. Dr. Brough has been medical inspector of Boston Health Department for twenty years, and was a valued assistant of Dr. Shea.

SOCIETY NOTICES.

WORCESTER DISTRICT MEDICAL SOCIETY.—The regular meeting will be held Wednesday, April 11, 1917, at 4.15 p.m. in G. A. R. Hall, 55 Pearl Street, Worcester, Mass.

At the request of the Standing Committee on Control of Cancer of the Massachusetts Medical Society, Dr. Fred B. Lund, of Boston, will address the Society on "The Early Manifestations of Cancer."

After the discussion of the paper there will be an opportunity for an open discussion upon "Our duty to the country in the present crisis."

The censors meet for examination of candidates for admission at 2 p.m., Thursday, May 10, 1917, at Worcester Public Library (Reference Department). Candidates should make applications on blanks to be had of the secretary at least one week prior to that date.

ERNEST L. HUNT, *Secretary.*

NEW ENGLAND OPHTHALMOLOGICAL SOCIETY AND BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY.—A combined meeting of these societies will be held on Thursday evening, April 12, at 8 p.m., at the Boston Medical Library, 8 The Fenway:

Papers:

"The Neurological Aspects of Syphilis of the Eye." Dr. Joseph Collins, New York.

"The Treatment of Syphilitic Affections of the Central Nervous System, with Special Reference to the Visual Pathways." Dr. Mark J. Schoenberg, New York.

Discussion opened by Drs. J. B. Ayer, P. C. Knapp, and Abner Post.

W. HOLBROOK LOWELL,
JAMES B. AYER,
Secretaries.

MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY.—The Annual Meeting of the Society will be held at the Quincy House, Boston, on Wednesday, April 18, 1917, at 11.00 a.m. The annual oration wil be delivered at 12.00 o'clock, noon, by Dr. Frank R. Stubbs of Newton. Subject, "Clinical Experience with Cases of So-called Acidosis."

Dinner will be served at 1.00 p.m.

LYMAN S. HAPGOOD, *Secretary.*

RECENT DEATHS.

CHARLES S. BRADDOCK, JR., M.D., known for his work as chief medical inspector of Siam and a leading expert on cholera and smallpox, died on, March 23, at his home in Haddonfield, N. J. He had, of late years, served as medical examiner for the Interborough Rapid Transit Company. In 1901, Dr. Braddock accepted the offer of Dr. Adamson of Bangkok, to become his assistant and served in that capacity a year. During that time he took a prominent part in the Governments campaign against smallpox, cholera and bubonic plague. Dr. Braddock was appointed chief medical inspector of the Royal Siamese Government, and in that capacity travelled all over the kingdom in his fight for sanitation and against disease. Cholera was then depopulating the country. Dr. Braddock burned village after village, and established the first isolation camp ever known. He stamped out the plague. For his services the late King Chulalonkhorn awarded him a diamond-studded medal. Dr. Braddock's most notable achievement was the perfection of a smallpox vaccine virus for use in the tropics, intended to withstand intense heat.

CAROLINE ROOT CONKEY, M.D., who died on February 24, at the Waterbury Hospital, Waterbury, Conn., from Bright's disease, was born in Enfield, Mass., July 8, 1844. She was graduated from the Woman's Medical College of the New York Infirmary in 1881, after which she moved to Watertown, N. Y., where she practised several years, moving to Waterbury, Conn., in 1887. She was connected with the Waterbury Hospital since its opening in 1889. She is survived by a sister.